

Agricultural and Industrial Survey of Ithya County

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Agricultural and industrial survey of Inyo County Calif., June-July 1917

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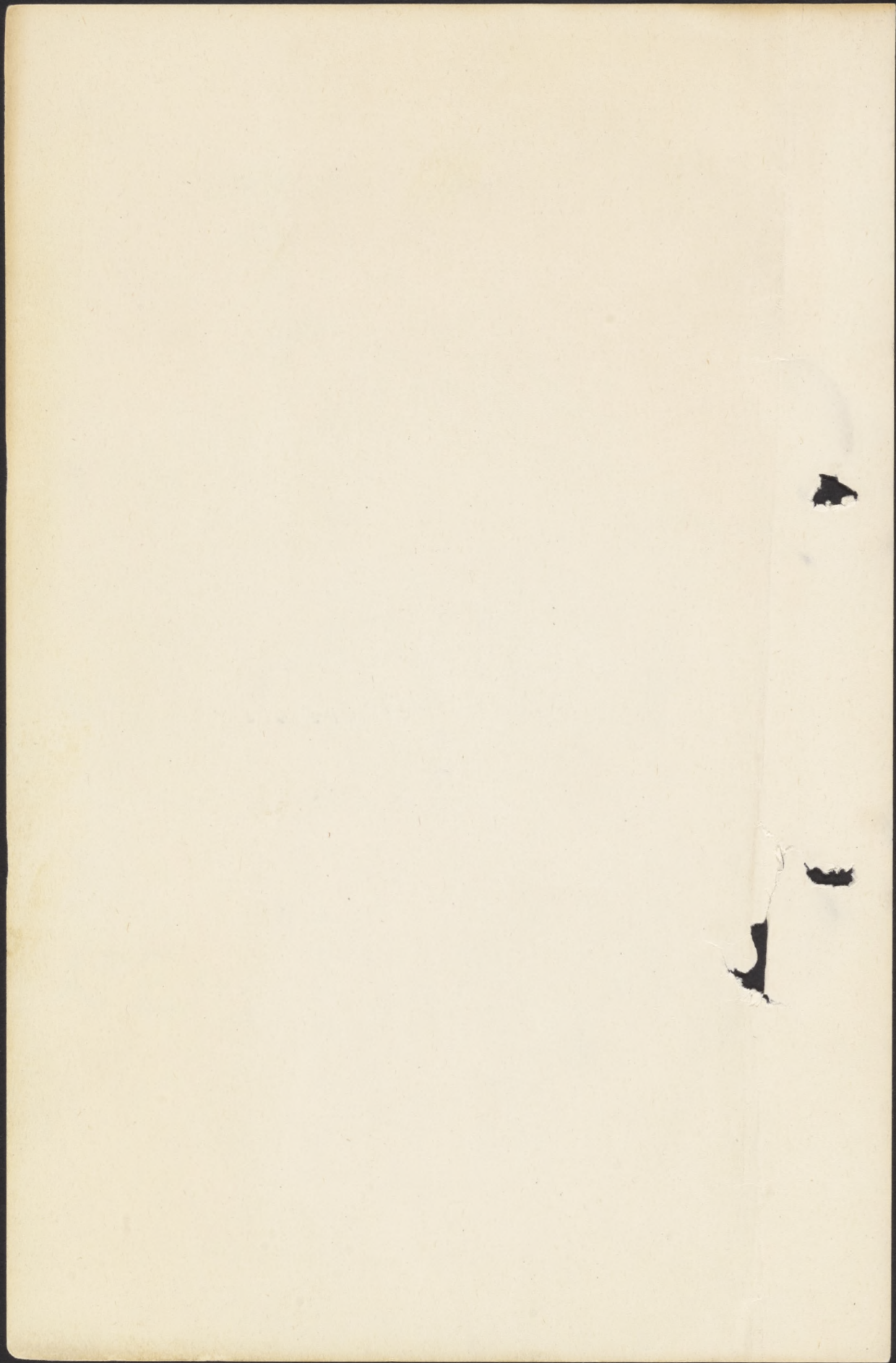
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AGRICULTURAL AND INDUSTRIAL

SURVEY

of

INYO COUNTY

CALIF.

made by

the

CALIFORNIA DEVELOPMENT

BOARD

OF SAN FRANCISCO, CALIFORNIA

at the request of the

BOARD OF SUPERVISORS OF INYO

COUNTY

June - July 1917

Thalia Weed Newcomb
Field Agent

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I N T R O D U C T I O N

Effort is made in the following pages to give the approximate costs of planting, cultivation and harvesting of the crops of Inyo County and a general reconnaissance survey of the industries, principal among which are the vast and varied mining activities and livestock.

Walled from the rest of the State by its stately barricade of snow crowned mountains, Inyo has not been invaded to great extent by the land speculator, booster literature or crop statistician and it is difficult to gather from the farmers and cattlemen, accurate or even approximate figures, for no record except in a few cases, is kept.

Inyo County is just awakening to its limitless possibilities, both agriculturally and industrially. With the younger generation of farmers, mining and business men coming to their proper grooves in this section, the reins of antiquated methods, non-progressive and non-receptive attitude held by the old resident are passing into the hands of men who are County and State-wide in their interests and who realize that nothing is to be gained by closing the doors of their rich little empire against sincere investigator, investor or homeseeker.

Rather would they help such people to a clear and unprejudiced view of the possibilities of their County, that after thorough and careful investigation only, choice may be made. It is such men who have made the compilation of the following report possible and who have materially aided with both time and money, our representative sent into the field to collect the data. At least five men on each crop, industry or district have been interviewed and the figures in each case here set forth are an average where estimates were not the same.

This report was made at the request of the Board of Supervisors of Inyo County, California, June 1917

by

THE CALIFORNIA DEVELOPMENT BOARD
of San Francisco, California

Thalia Weed Newcomb,
Field Agent.

Copyright applied for 1917.

Vivian Jones, Treasurer, } Inyo
Authorities: A. H. Swallow, Action Dist. } County
Attorney } Court
Jess Hession, County Clerk } House

Inyo County, the second largest county in California is situated on the extreme eastern edge of the State and has as its boundaries, Mono County to the north, the Nevada-California State line on the east, San Bernardino and Kern Counties on the south and Tulare and Fresno Counties on the other side of the Sierras to the west. Perhaps no County in the State offers such diversified topography and geological formations for it contains the highest peak in the U. S., Mt. Whitney, 14,501 ft. above sea level, from whose base the land drops away in a succession of arid and barren mountain ranges and desert plateaus housing a wealth of minerals, to Death Valley, the lowest depression, 280 ft. below sea level; the newest range of mountains on the continent, the jagged Sierras and at their foot along the western side of Owens Valley, the Alabama Hills, declared by scientists to be the oldest geologic formation.

Inyo County was created March 22, 1866, with a land area of 10,019 square miles, of which practically 300,000 acres is under cultivation at this time. Many of the desert valleys might be reclaimed by huge impounding dams, but this would be a gigantic undertaking for any one of them, necessitating either the services of the U. S. Reclamation Service or Department of the Interior, or almost unlimited capital from a corporation or private source.

The largest agricultural area lies in the Owens Valley and practically the rest of the County is adapted only to grazing and range land and mining. The largest percentage of ranches average 100 to 175 acres, with those 50 to 100 acres second in number.

According to the census of 1910, the population of the County was 6,974 and in 1917 is estimated about 8,000. The assessed valuation of non-operative property is \$7,040,989.; of operative property \$1,882,244. The outside tax rate is \$1.60; inside \$1.30 per hundred.

IRRIGATION AND
DRAINAGE

George M. Shuey, Independence

Authorities: H. C. Miller, Drainage Engineer, Bishop

IRRIGATION

Throughout practically the entire Owens Valley the same method, source and management of irrigation exists - that of the mutually owned and operated canal systems whose sources are the mountain streams which issue from the Sierras on the west. The Owens River enters the Valley just northeast of Round Valley, making an eastward turn for a few miles to the east side of the Valley and flows south into Owens Lake, a distance of about 65 miles.

Many mountain streams feed it from the perpetually snowclad Sierras above Bishop. The riparian rights of these and the streams flowing from the mountains on the west side in Owens Valley, are owned by old residents with the City of Los Angeles having the largest holdings throughout the Valley. The water supply for the City of Los Angeles is taken off 14 miles north of Independence and the water flows in a section constructed by dredgers, unlined, 22 miles, from where it is conveyed by concrete aqueduct and steel syphons to the City of Los Angeles. Many millions of dollars was expended in the building and maintainance of this water system and this was perhaps the first to advance Owens Valley commercially. This brot in large capital and helped introduce modern methods of farming and handling of land and water. The attitude of the old times, small farmer and non-progressive, has been anything but receptive. They steadfastly refuse to see where the intensive agricultural methods and money spent by the City of Los Angeles have done much in opening up the County to a new era of prosperity and high productivity. Many of these same men hold the water right on streams whose constant flow is more than sufficient to abundantly irrigate their holdings and answer all domestic needs, and which would bring under cultivation many acres of land which is now non-productive and without water, altho so situated that irrigation from such a source be both practical and within financial possibility of the individual farmer.

The City of Los Angeles owns many acres along the floor of the Owens Valley. Some of this is among the most fertile and highly productive land found throughout the County and in several districts

farm acreage of alfalfa, sugar beets, corn, wheat, barley and truck are raised to support herds of beef cattle and large bands of hogs, are maintained under the direction of a foreman and crew by the City of Los Angeles. In other districts their holdings are obtainable on a rental basis. The water right however, is revocable from year to year and this debars many from renting on a long term contract, erecting homes, etc. So the majority of acreage controlled by the City of Los Angeles goes for grazing and meadow land.

The twin of irrigation in Owens Valley at the present time is WASTE - through three causes: Excessive seepage, ignorant irrigation and the monumental selfishness of those holding riparian rights to the streams and who, when their agricultural and domestic needs are supplied, woefully waste the water by letting it merrily run its natural course thro their lands and further add to the high water table and alkali content of the valley lands.

The exceedingly porous character of the soil along the mesas which all the streams cross either visibly or in subterranean flow for distances of from 3 to 5 miles before being used for irrigation, makes the seepage loss as high as 60% of the measurement, from the point where the stream emerges from granite and rock channel at the mouth of the canyon to the ultimate place of its use.

The duty of water is something of which the average farmer in this section knows little - or cares less. Inadequate leveling and water conduct adds greatly to the loss. Soil washing in the sandy and light types of soil unless planted to grains which more or less tend to minimize the force of the water, is oftentimes very great. Flooding is the prevailing method of irrigation. Where furrows are used the water is often allowed to run full force, unattended. Breaks occur unnoticed. Sometimes the water runs for days. Few attempts are made at water measurement or gauging the amount necessary for various soils and crops.

It is our understanding that the basis of the first filings for riparian rights made by the old settlers in the County, was for a safe percentage more miners inches or acre feet than the stream at maximum run off would ever hold promise of flowing.

The great water loss might be minimized by combined efforts of land owners and holders of riparian rights, in the construction of concrete canals and by putting in small impounding dams. Sites for this are not plentiful or the construction cheap. A proposition of this kind would be prohibitive to an individual, but quite within the means of a community who might realize their initial construction costs on long term payment arrangements by the farmers enjoying these benefits, the number of whom could be materially increased with the extension of irrigated acreage throughout the County.

The canal systems now operative charge the water users a pro rata share of the upkeep of ditches, services of a zanjero or ditchman, construction and installation of weirs, etc. When an acre is sold it customarily carries one share of water stock in the irrigation company serving the property, or a stipulated number of acre feet. Four companies operate in the neighborhood of Bishop, two around Big Pine, two for Independence and Fort Independence, one each in Manzanar and Lone Pine in addition to many streams whose flow goes to one ranch or small group of ranches.

Around Bishop and Manzanar are perhaps the best examples of intensive farming, where community interests and mutual cooperation shows most plainly the immense possibilities of bringing under cultivation the extremely fertile soils of the Owens Valley. Manzanar is the only community where tile and concrete have been extensively used to convey irrigation water to orchards and field crops, and the initial cost is more than offset by the degree of efficiency and minimum of hand labor, overseeing and soil washing which results.

DRAINAGE

Year by year the acreage rendered unfit for agricultural uses in the Owens Valley is steadily increasing owing to the wasted irrigation water and seepage which is backing up on the valley floor and filling the low places on the rolling ground of the ranches in the sections toward the Sierras on the west. This is especially marked in the vicinity of Bishop at the northern end of the Valley and it is proposed that a drainage system be installed which will take in some 20,000 acres with boundaries about

8 miles south of Bishop, the Owens River Canal on the west, the irrigation canal about 3 miles north of town and on the east by the Owens River. It is the plan to form the district association from land owners whose holdings will derive benefit by such drainage, but it is doubtful whether these individuals in all cases see or appreciate the value of such action. It may be necessary to make the proposition a community or even a County one, for not only is the agricultural land effected but the public health menaced in the vicinity of Bishop by the sloughs and mosquito breeding places thus afforded, and the drain from the septic sewerage system of Bishop which is being gradually washed throughout the soil to the east of that town.

Much of this land is merely pasture but by the installation of a drainage system could be made to yield \$150. per acre per annum land value.

The U. S. Dept. of Agriculture sent two officials to investigate and report on the advisability of such a drainage system around Bishop. The report was favorable and that the work might be done at a very reasonable figure. One of these experts who also represented State interests further stated that the State would agree to give from \$700. to \$1,000. toward the completion of such a system, if the people who were interested in Owens Valley would subscribe a like amount. There are in the proposed district from 200 to 250 ranches which would be effected by such a system and the estimated price was an assessment of \$20. per acre, to drain the land, which might be paid back over a period of 20 years, with interest at 6%. The main drainage canals were to be open ditches, about 12 ft. deep and from 40 to 50 ft. wide with laterals where necessary. Although the proposition when put to public vote went to the "Nos", the citizens and farmers who realize future effects, have not despaired and the result of the meeting is only a more concentrated effort on their part to affiliate with interests powerful enough to materially aid if not force such an issue.

There are roughly estimated, about 35,000 acres under irrigation in the vicinity of Bishop. While there are an abundance of dam and reservoir sites in the mountains along Bishop Creek which is one of the principal tributaries of the Owens River,

an appeal to the U. S. D. A. that they erect and operate such dam or reservoir, met with refusal by the engineers sent to investigate the advisability of such course. It is the universal assertion of holders of riparian rights in the County that no such dam could be built without arrangements with the vested interests on the stream below, for the storage and use of the head or higher up waters.

C L I M A T E

Authority:-G.P.Doyle, M.D., Bishop

The climate of Inyo County is especially healthful. The variations in temperature are sometimes very great in the valley sections but following the warmest summer day the nights are always cool and restful.

Throat and lung troubles are immensely benefited in this section of California. The high, dry air of the desert is sustaining and many afflicted with lung troubles have come into this section and within a few months after arrival, the change for the better has been very marked. The abundance and purity of the water is perhaps another factor in eliminating disease, both for humans and animals in Inyo County.

In the following tables are given climatological data for the rainfall and temperature, covering a period of the past four years.

TEMPERATURE TAKEN AT INDEPENDENCE, INYO COUNTY, 3,907 ft. Elevation											
Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov. Dec.
1913	Max. 65	67	78	84	89	92	103	96	94	82	76
	Min. 4	16	14	27	29	42	51	50	39	29	24
1914	Max. 57	64	78	84	90	101	96	100	88	82	74
	Min. 17	20	26	29	35	39	53	50	39	38	14
1915	Max. 56	60	78	80	92	94	98	98	91	88	74
	Min. 18	22	26	31	27	47	45	52	38	34	15
1916	Max. 52	60	80	84	86	97	103	96	90	78	73
	Min. -2	2	26	33	38	40	45	48	38	26	16
TEMPERATURE TAKEN AT LONE PINE, INYO COUNTY, ALTITUDE 3,728 ft.											
1913	Max. 67	67	80	87	90	94	105	100	96	85	77
	Min. 4	17	19	24	30	44	47	46	35	29	21
1914	Max. 64	67	81	88	93	100	96	100	95	83	79
	Min. 16	20	26	27	39	36	48	47	40	34	19
1915	Max. 67	70	80	84	91	95	98	100	95	87	84
	Min. 22	24	29	32	30	42	47	53	44	37	22
1916	Max. 59	63	82	82	80	96	98	98	93	78	77
	Min. 4	3	30	35	32	35	41	40	37	26	20
											61
											18
											55
											3
											74
											22
											68
											4

CREEK,

TEMPERATURE TAKEN AT BISHOP, INYO COUNTY, ALTITUDE 8,500 ft.

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1913 Max.	51	46	56	61	70	74	80	75	72	62	56	46
1913 Min.	-12	-2	5	17	14	29	39	41	24	14	10	5
1914 Max.	55	46	47	59	78	79	78	82	71	62	57	45
1914 Min.	4	7	10	20	20	25	41	38	29	27	10	1
1915 Max.	62	65	78	81	93	97	99	100	93	89	78	70
1915 Min.	8	18	21	24	25	33	36	41	29	25	9	5
1916 Max.	29	61	85	85	87	91	96	98	92	76	72	67
1916 Min.	-15	-3	22	29	29	36	38	41	33	23	11	-9

TEMPERATURE TAKEN AT GREENLAND RANCH, INYO COUNTY, ALTITUDE -178 ft.

1913 Max.	82	90	98	109	120	119	134	124	116	105	90	--
1913 Min.	15	30	36	47	52	31	70	74	66	60	58	--
1914 Max.	73	85	98	104	116	124	122	126	112	101	91	82
1914 Min.	52	47	52	50	53	60	76	70	60	68	57	52
1915 Max.	76	75	92	101	113	118	120	124	113	101	89	69
1915 Min.	50	43	45	56	52	70	89	89	79	49	39	--
1916 Max.	76	82	98	104	110	121	127	121	116	98	80	73
1916 Min.	--	32	46	61	57	67	76	75	63	44	30	24

PRECIPITATION TAKEN AT BISHOP, INYO COUNTY, ALTITUDE 4,450 ft.

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1913	1.25	2.05	0.09	--	0.10	0	--	--	0	T	0.56	0.20	--
1914	9.67	1.19	0.00	0.19	T	0.10	T	0.0	0.38	0.0	0.0	1.0	12.53
1915	0.96	1.69	1.48	0.69	0.83	0.00	0	0	0.55	0	0	0.08	6.28
1916	9.51	0.50	0.70	0.10	0	T	0	0.10	0.54	0.78	0	2.70	14.93

PRECIPITATION TAKEN AT BISHOP CREEK, INYO COUNTY, ALTITUDE 8,500 ft.

1913	4.52	4.30	1.00	0.50	0.45	2.75	--	--	0	0.10	2.10	2.10	--
1914	No record												
1915	--	--	--	--	0.64	0	--	0.10	1.0	0	10.30	2.60	--
1916	9.10	2.30	--	--	0.50	0	0	1.85	0.50	4.22	0.02	3.33	--

PRECIPITATION TAKEN AT GREENLAND RANCH, INYO COUNTY, ALTITUDE --178 ft

1913	0.01	1.90	0.10	0	0.01	0	0.60	0.01	0.30	0	1.61	--	--
1914	0.67	0.21	0	0.12	0	0.05	0	0	0	0	0	0.60	1.65
1915	1.10	0.02	0.02	0.08	0.02	0	0.07	0	0	0	0	0	1.31
1916	1.51	0.20	0.02	0	0.40	0	0	0	0	0.10	0	0	2.23

PRECIPITATION TAKEN AT INDEPENDENCE, INYO COUNTY, ALTITUDE 3,907 ft.

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1913	0.33	2.74	0.06	0	0.31	0.07	1.56	0.96	0	T	0.95	0.38	7.36
1914	7.29	0.30	0	0.18	0.34	0.01	0.16	T	0.21	0.03	0	0.78	9.30
1915	0.98	0.59	0.21	0.44	0.43	0	0.04	0.04	0.01	0	T	0.26	3.00
1916	8.69	0.57	0.31	0.21	0.01	0	0	0.22	0.07	0.84	0	0.92	12.84

PRECIPITATION TAKEN AT IONE PINE, INYO COUNTY, ALTITUDE 3,728 ft.

1913	0.37	2.71	0.70	T	0.53	0.29	0.52	1.57	0	T	0.41	T	7.20
1914	3.09	0.47	0	0.31	0.50	0.17	T	0	T	0	T	1.20	5.74
1915	1.90	0.85	0.84	0.75	0.10	0	T	0.05	T	0	0.14	1.12	6.75
1916	4.95	0.52	0.01	0.20	T	0	0	0.11	0	1.90	T	2.08	9.83

A L F A L F A

Geo. M. Shuey, Independence			
F.C. Schabbell, "	ranch	21	mi.n.
Willard Ahrens, Big Pine	"	6 $\frac{1}{2}$	" s.
Harry Shaw, Bishop	"	2 $\frac{1}{2}$	" ne
Authorities: Fred M. Hess, "	"	1 $\frac{3}{4}$	" s.
George M. Wells, Manzanar	"	1	" sw

EXTENT AND SECTIONS

Alfalfa in Inyo County is the backbone of the agricultural and also of the cattle industry, for the stock wintered and finished in Owens Valley are fed almost exclusively on alfalfa hay in addition to the wild meadow grasses and volunteer growth of field grains. With increasing interest and growing importance of the dairying industry, alfalfa becomes even more necessary to the farmer in this section. There were about 32,000 acres of standing alfalfa in 1916 and the following year saw a small increase, or approximately 41,000 acres. No section in Owens Valley may be specified as best suited to its production, for nearly every ranch in the Valley has its alfalfa patch.

SOIL AND CLIMATE

Alfalfa will thrive best on limy soils but will flourish and bear credible crops on a great variety of soils as demonstrated by good stands on every type and texture of soil from pure sand to heavy adobe, which may be observed in this valley. The rising water table in many sections of the Owens Valley however, is the cause for many spots which are drowned out and show their lifelessness in yellow patches against the dusky green of the surrounding field.

COST OF PRODUCTION

Many of the alfalfa fields in the Owens River Valley are ten or more years old and many of these have never been re-seeded in the bare spots. Careless farming methods and a decided tendency to postpone any cultural operation which may be put off until "next season", accounts for many of the poor alfalfa fields seen along the highway in a journey throughout the length of the Valley. On the whole, however, the alfalfa in Inyo County is of exceptionally even growth, full crowns with sometimes as many as 30 stalks to the plant in old fields. In height and richness it presents a spectacle unequalled anywhere else in California. What yields and profits might be enjoyed in this naturally favored locality

under methods of careful cultivation and sowing, would perhaps be almost beyond belief.

The majority sow in April although some prefer fall sowing in September. The ground is given a deep plowing of about 6 to 8 inches which on the lighter types of soil costs about \$2.25 per acre and on raw land averages \$2.90 per acre. This is followed by a thorough harrowing and when necessary to produce a good soil mulch before planting, sometimes cross harrowed at a cost of about 75¢ per acre for each operation. The ground is thoroughly soaked before planting and the general practice throughout the Valley is to sow broadcast about 20 lbs. of seed to the acre, which costs on an average for the past 5 years, including the high price of 1917, about 15¢ per lb. Some vary this method by sowing with a drill and harrowing the field afterwards to evenly distribute the seed. Inasmuch as there are few patches where checking and leveling has been done, distribution by flooding after sowing is not practiced here. Immediately after planting a thorough irrigation is given the alfalfa field and the labor of putting on the water amounts to about 75¢ per acre. No more irrigation is given until two or three leaves appear, when another flooding takes place. This is repeated in most instances where the soils run to sandy loams and light types, about every three weeks during the growing season. Oftener, if the appearance of the stand or the dryness of the soil indicates stringent need. This usually amounts to from three to five irrigations per season and the cost of applying the water will be about the same in each instance. Some few progressive growers maintain that the field benefits by a thorough discing when the stand is about 3 inches high. Costs of planting an acre of alfalfa and bringing same to time of first cutting would therefore be about as follows, on raw land;

Plowing	\$2.90	per acre
Harrowing & x harrowing	1.50	" "
20 lbs. seed @ 15¢ per lb . .	3.00	" "
Thorough irrigation, labor . .	.75	" "
Seeding with drill \$1.00		
" broadcast	.50	
	2) 1.50	
Average	.75 . . .	.75 " "
Minimum labor 4 irrigations	3.00	" "
Total	\$11.90	" "

This cost is exceptionally low owing to the fact that water right goes with the purchase of the land and there is no charge for water.

IRRIGATION

Only two framers interviewed out of a score knew or were even able to estimate the amount of water given during a season. The average of these two on two widely different types of soil were 8 and 10 acre ft. respectively, per season. Immediately after the first cutting the field is again irrigated and sometimes just before the last cutting when the plant is blossoming if the soil indicates the need.

VARIETIES

The Chilean is the most widely grown although during the past three years some extensive plantings of Hairy Peruvian have been made and small tracts of the Smooth Peruvian. The latter is not so nutritious however, and in this climate is a slow grower.

HARVESTING AND YIELD

The first crop is generally ready to cut by the first of June in the southern end of Owens Valley and about the 10th in the northern part, around Bishop. One rake usually follows two mowing machines and a force of this size can cut and rake into windrows about 12 to 15 acres a day. The hay is left in this form for two or three days when the season is warm and dry, then forked into cocks or sometimes if the drying process is thorough, even loaded on the hay team and hauled to the stack or baler. Estimated costs of harvesting operations are as follows:

Cutting, cocking & raking	\$.70	per ton
Loading, hauling & stacking	2.08	" "
Total minimum	\$2.78	" "

Baling is done by a commercial baler at a cost of \$3. per ton. The general method in this section has been to let the alfalfa fully flower before cutting as the farmers enjoy better prices for their hay when cut at this time and the product is more nutritious and desirable in the outside markets. Two crops per season have been the rule although many are

beginning to find that three and sometimes four may be enjoyed with a trifle more labor and the hay bring as good price as when the old method was followed. Some phenomenal yields have been reported running as high as 8 and 9 tons per acre, but 4.16 tons to the acre per year, is the average throughout the County, all sections. Accurate figures of cost have been difficult to procure as most of the farmers work their own places and do not count their time or the use of their stock, as worth anything. The amount of days labor hired in most instances was the production or cultivation cost given although the farmer and some other member of his family might have given many dollars' worth of time to the crop in question.

The second crop matures about 45 days after the first cutting and this stands good until the cold weather of fall renders the soil chilly and the plant fails to respond.

MARKETING AND SELLING PRICE

The bulk of the alfalfa raised in the Owens River Valley and all that in Deep Springs and Round Valleys, is either used for the winter feed of stock owned by the grower or sold to cattle men who winter their large herds of beef cattle in the Valleys. About 25% of the production is shipped to Los Angeles and the Nevada mining camps and the average price received by the grower for baled hay outside the Valleys has for the past five years been about \$10. per ton, not including the high quotations and contracts for the 1917 crop. Sold loose in the stock the price has averaged \$8.25 per ton for a 6 year period. The field is generally pastured after the last cutting and some farmers who have no extensive meadow land cut two crops and the field is coming up for the 3rd cutting turn in the stock. Pasture of this kind rents for \$2.50 to \$6. per acre, depending upon the condition and desirability of the field.

PESTS, HINDRANCES AND DISEASES

No control measures have as yet been applied to eradicate or even check the fox tail which is by far the most serious menace to the alfalfa fields of the County. Some farmers have plowed up the pest when it first appears outside their fences and disced the field on the other side as far back as the foxtail shows in the alfalfa. The Horticultural

Commissioner of the County is working on methods of eradication and it is to be hoped that by the season of 1918, some stringent measures will not only be advocated but sponsored and adopted by the farmers throughout the County. Loveweed, dodder or flame-vine, as it is commonly called is another serious menace in this locality which is steadily increasing. If taken in time this may be eliminated as it is not strongly prevalent throughout the County as yet, but if allowed free range will assuredly blast any ambitions the raiser of alfalfa seed may have, to produce and market his seed crop in outside marts.

Gophers in sandier types of soil and moles in the sandy clays and adobes of the meadow lands, make the upkeep of irrigation ditches and levees sometimes double in cost. Poison, drowning out and connecting the exhaust of an automobile to the holes of these pests by means of a rubber hose after thoroughly wetting down the ground and stopping up other exits, are some of the means of eradication which are practiced with more or less success. The alfalfa moth in seasons works havoc and loss in many localities throughout the Owens Valley. Burning stubble or rotation seems to be about the only means of meeting this pest.

PRICE OF LAND

Raw land carrying water right and suitable for the growing of alfalfa may be purchased in the Owens Valley for \$50. to \$150. per acre and standing alfalfa fields for \$100. to \$250. per acre.

The alfalfa in Inyo County is truly remarkable for its longevity. Many patches are over 20 years old and have never been reseeded but bear full, even stands and are cut two or three times each season. This is doubtless due to the fact that the vitality of the plant is not exhausted here as in most of the other alfalfa growing sections of California by excessive cutting and forced growth.

PROFITS

These depend very largely upon the individual grower and his ^{method} of handling the land, cultivation operations and harvesting costs, but a safe and conservative net profit per acre per annum would

20

be \$10. to \$15. per acre.

ALFALFA SEED RAISING

The alfalfa seed raised in this section shows high germination tests and up to the present time the supply has always been insufficient for local demand, although soil and climatic conditions favor the growth of this branch of alfalfa raising as an important industry.

Unlike other sections of California where alfalfa is grown for seed, the first crop is allowed to head out well and cut about August for seed. Sometimes the second and last cutting is also harvested for this purpose and the average production from one cutting is about 300 lbs. of seed per acre. All cutting is done with a binder the header seemingly is little in favor here. A machine which goes into the field of the grower and operates at a cost of from \$50. to \$60. per day, plus board of crew of two men and feed of stock, can handle about 15 tons of alfalfa hay per day, threshing out the seed which is cleaned at the cleaning mill in Bishop. Charge for this service is about \$4. per ton and the capacity of the cleaning mill about 2½ tons per day. Alfalfa hay from which the seed has been extracted, depreciates about two thirds in value as hay, but is nevertheless excellent feed for stock cattle.

Authorities: E. M. Nordyke, Horticultural Commissioner, Inyo County, Bishop;
U. G. Smith, Bishop, ranch 3 mi. w.
W. H. Alcorn, Supt., Red Mountain Fruit Ranch, Big Pine, ranch 9½ mi. s. w.
Neel Bell, Independence, ranch 3 mi. nw
R. A. Wilder, Manzanar, ranch 1 mi. w.

EXTENT AND SECTIONS

Apples next to alfalfa are the most promising and important agricultural product. In 1917 there were in the County about 60,000 non-bearing and 54,000 bearing trees. There is hardly any section of the County unadapted for their production and the medals and prizes awarded to Inyo County apples in other and larger apple districts of the State as well as at expositions and fairs, mark it as a section where the finest fruit may be raised. Pears are fast coming next to apples in importance and profit here.

SOIL AND CLIMATE

While many varieties have their individual soil type preferences, the bulk of the crop is raised on the sandy and gravelly loams throughout the hills districts.

PLANTING AND CULTIVATION

From the middle of February to the last of March is the best time for planting and the trees are set out 30 x 30 ft. in the majority of orchards, or 48 trees to the acre, which cost about \$25 per hundred delivered at valley points. Before planting the ground is given a most thorough cultivation sometimes with cross plowing, discing and harrowing until the soil presents a fine, moist mulch. This will average about \$25 per acre for preparation and the digging of holes 24 x 18 inches, setting the trees, filling, etc., will average about 15¢ per tree or \$7.20 per acre. Some hillside contour plantings are made 30 x 75 ft. It is claimed by many old growers that close planting will exhaust the soil fertility very rapidly in apple orchards—much more than other fruits. One or two cultivations are given the young orchard each year to time of bearing. Including spring plowing and a couple of cultivations this will average about \$5.25

per acre per year. The trunks of the young trees are often whitewashed or wrapped in burlap against the destruction by sun and insects. Initial costs then for an acre of apples would be about as follows:

Preparation of the ground. . .	\$25.00	minimum	per	acre
48 trees @ \$25. per 100.	12.00	"	"	"
Digging holes, setting 48 trees	7.20	"	"	"
Cultivation one year.	5.25	"	"	"
About 10 irrigations @ 50¢ per operation for labor.	5.00			
Total first year costs. . .	\$54.45	per	acre	

The trees bear some fruit the fifth year but commercial crop begins the 8th.

IRRIGATION AND FERTILIZATION

The young orchard must be irrigated very heavily, about every three weeks beginning after blossoming time. Old orchards receive about the same number of irrigations but of course require more water, and the cost will be about 75¢ for labor of tending ditches, etc. Careful orchardists and those securing best results irrigate by furrow but when the orchard is utilized as an alfalfa patch or grain field, the prevailing method is to flood. This however is not advocated.

Bearing orchards receive and need much fertilization. No commercial fertilizer is used but barnyard manure when obtainable in quantity of about six loads per acre is spread on in the fall and plowed in during the first spring cultivation. Costs of material not obtainable. Great quantities of fertilizer is wasted in this section. Some consider the plowing in of alfalfa stubble sufficient fertilization and the majority of old orchards are sadly lacking in both fertilization and cultivation care. No cover crops are grown here.

Young orchards are greatly intercropped to corn, beans, peas, berries and tomatoes throughout the section. Some of the older orchards which receive no cultivation, have gooseberry and currant bushes planted between the trees and it is asserted by their owners that the trees bear as prolifically and steadily as when the ground in the orchard is given the proper care and attention. Hog fencing

is often used to separate one-half acre tracts throughout the orchard and the sows with litters allowed free range except in harvest season, but turned into clean up the orchard immediately after picking. This, however, whether for the good of the orchard or the hogs, is not recommended.

VARIETIES

The Winesap, Newtown Pippin and the Jonathan are the commercial shippers, beautiful in appearance and with fine shipping qualities. Spitzenbergs, Arkansas Black, Rhode Island Green, White, Winter Banana, Grimes, Golden Lover and nearly every other known variety is also grown in limited quantity.

PRUNING AND SPRAYING

The young tree is pruned twice a year, in the fall when the tree is dormant and in the summer at a cost of about \$3.00 per acre per operation until the tree is from four to six years old. The majority of orchardists prune old trees but once in the fall and the cost will average around \$5.00 per acre.

No spraying is practiced until the tree comes into bearing, when lime sulphur solution in the dormant stage is used for San Jose scale and apple aphid at a cost of about \$1.40 per acre per operation. Later it is necessary to spray with black leaf "40" to eradicate the eggs of the red spider at cost of about \$6.50 per acre per spray.

Arsenate of lead is used for the codling moth and costs \$2.50 per application. This pest here is especially destructive and must be well controlled in order that the leafage and crop may survive. One winter spraying and two summer sprayings for the codling moth are necessary.

HARVESTING AND MARKETING

About the first of September sees the beginning of the apple shipments which last until November and sometimes even later. Picking and packing in 42 lb. boxes will average about 12 $\frac{1}{2}$ ¢ per box,

the price of which is 15¢ delivered valley. The yield varies throughout different districts under various methods of handling and cultivation but will run as high as 125 boxes per acre for the entire County or 2.6 tons per acre green fruit. Record of quite a few orchards which have consistently produced 190 boxes per acre per year were encountered. The Nevada and mining camp market do not require that the apples be wrapped, but the Los Angeles market does and this will average about 5¢ per box more for paper and 10¢ for labor. The orchard is gone over twice and sometimes three times and the average selling price has been about \$1.50 to \$2.50 per box to the grower, who receives his price shipping point. Hauling will average about \$3.00 per ton for a distance of five miles. This is an item of important consideration here, where much hauling is necessary. Life of the orchard for profitable bearing is estimated at 27 years in this locality. After this time the trees are often grafted over and the product as desirable and prolific as the original tree.

PRICE OF LAND

Land suitable for apple culture may be obtained unimproved for \$75. to \$200. per acre with water right and improved orchards not bearing, under five years of age for about \$300. with bearing orchards from \$500. to \$700. per acre.

PROFITS

Inasmuch as the majority of the apple growers here do all their own work both in the matter of cultivation and harvesting, the average profit of \$400. per acre is high as compared with other sections of the State where the crop is larger and the labor costs are excessive.

Authorities: E. M. Nordyke, Horticultural
Commissioner; Inyo County, Bishop;
Thomas Kehoe, Independence
Neel Bell, Independence, ranch 2 $\frac{1}{2}$
miles, n. w.

EXTENT AND SECTIONS

There are about 75 non-bearing and 1000 bearing cherry trees in Inyo County, and 50 non-bearing and 1100 bearing apricot trees. All planted in family orchards and when they do bear a full crop they produce a fruit of most delicious flavor, although both apricots and cherries are small in size compared with the product of other sections of the State.

VARIETIES

Royal and Hemskirk apricots and Queen Ann, Black Tartarian and Governor Wood cherries are the principal varieties grown.

MARKETING AND YIELD

Local markets or the farm table takes all the crop of either of these fruits and the yield is not dependable for them.

CROPS
BARLEY, OATS AND
WHEAT

George Shuey, Independence
Frank A. Campbell, Bishop, Ranch
Authorities: 16½ mi. n.w.
F.E. Turner, Independence, ranch 2¼ mi. n.
J.S. Gormen, " " 2 mi. n.
C.D. Thompson, Bishop, " 3¼ " s.w.
J. Barlow, " " 2½ " w.
Russell Spainhower, Foreman Acqueduct Ranch, Lone Pine

EXTENT AND SECTIONS

Throughout the entire Valley, acreage of field grains is found to supply local flour demand and grain and hay for the livestock and poultry. Wheat is the only grain raised on a large commercial scale or surplus for outside shipment. There were in the spring of 1917 about 8,000 acres planted to wheat in Inyo County, with 1,700 acres of barley and 2,560 acres of oats and 6,000 acres of clover and timothy, according to the report of the Horticultural Commissioner and Assessor of the County.

CLIMATE AND SOIL

The climate here seems best to favor spring planting, although many growers sow for winter grain which matures about a month earlier than the spring planting. It is maintained that soil not suited for the production of anything else, provided the water table does not approach too close to the surface, is "grain land". Rotation is practiced by the careful farmer but under old time methods in the valley, only when the alfalfa so thins that plowing and sowing is necessary. Some few farmers interviewed plan a rotation of wheat or barley, sugar beets, follow by alfalfa for two or three seasons.

PRODUCTION AND COST

Grain farmers claim that to plow sod or old alfalfa land costs about \$5. and stubble land, about \$2.50 per acre. Harrowing or disking follows at costs of 40¢ and 75¢ per acre, respectively. Some bluestone, but the majority use formaldehyde to prevent smut. The U. S. Dept. of Agriculture and the University of California both issue for free distribution, booklets with full instructions and costs of either process. For winter sowing 70 lbs. is the average and for spring planting usually about

BARLEY, OATS AND WHEAT - 2

February, 109 lbs. to the acre, mostly drilled at a cost of about 75¢ per acre for team and labor with a 4 horse drill. When planting occurs on old alfalfa land it is often profitable to disc the field just as the grain is getting a start. This is also a good plan when foxtail makes its appearance and will do no injury to the crop is done early. If the field is spiked or rolled in early spring an additional expense of 50¢ per acre is necessary. About 100 lbs of barley and 90 lbs. of oats are planted, to the acre. All spring sowing. About one irrigation is given winter wheat, in the fall and when it is well up, 2 or 3 more in the late spring before it begins to yellow. Spring sowings call for 3 or 4 flood irrigations. Small attention is paid to leveling and few grain or even alfalfa fields present an even surface. No dry farming altho experimental acreages in the desert valleys have proven failures.

HARVESTING AND MARKETING

Winter wheat is ready to cut in June and the spring, in July. Binders are used to the exclusion of headers throughout the County and binding and shocking costs about \$1.70 per acre, while threshing will average from \$3. to \$3.50 per ton of grain. Much of the wheat in this section goes to local flour mills and some is shipped out, Los Angeles and Nevada points take the bulk of the shipments. All the barley and oats raised here are consumed locally.

It costs about \$2.50 per acre to cut and stack the hay crop. This includes hauling an average distance of 1 mile. The grain is allowed to become thoroughly dried after cutting before shocking. This is generally a week or ten days after cutting. Little grain is cut for hay however, unless the crop fails to head.

YIELD AND SELLING PRICE

The five year average yield and selling price for the grains has been about as follows, which includes the high prices of 1916:

<u>Variety</u>	<u>Yield per acre</u>	<u>Average selling price</u> <u>for R.R. Shed</u>
Barley	1,500 lbs.	\$35.00
Oats	2,000 "	32.50
Wheat	1.16 tons	34.50

It must be remembered that the farmer shipping from the Owens Valley has an extraordinarily long haul unless he raise his crop in the vicinity of Laws or some of the ranches of the east side, near the railroad. 5 miles is about the average distance and grain makes extremely heavy hauling.

Stubble fields may be rented to the sheep men at a return of at least \$2.50 per acre and for cattle or horses if the straw is left, for 25¢ to \$1.50 per head, depending upon the amount of straw and the time the owner desires to leave the stock in the field.

Commercial threshers travel through the country during harvest time, operating at a cost of \$3.50 per ton sacked grain. In addition this price includes the feed of the men and stock and sacks which during 1917 have gone up to 12½¢ for second hand and 15¢ for new barley sacks. It is expected that with the rising price of grain the commercial handlers, threshers, binders, etc., will demand more pay as have farm labor throughout the entire State.

PROFITS AND PRICE OF LAND

It is estimated that a fair net profit on wheat is about \$12. to \$15. per acre, barley slightly higher and oats a little less, here.

Land suitable for grain production and unfit for more profitable crops may be obtained in Owens Valley for \$100. to \$200. per acre with water right. Much of the salt grass meadow land owned by the City of Los Angeles may be rented from 50¢ to \$1.50 per acre per annum. This land commonly rents as grazing land at from 25¢ to \$1.50 per acre for cattle or horses, depending upon the quality of the growth.

DISEASES, PESTS AND HINDRANCES

Smut on wheat, for which it is necessary to bluestone or formaldehyde seed; rust on oats which

has been rather severe in sections; rising water table on the lowlands - are the worst menaces. Hessian Fly making its first appearance the summer of 1917. Sunburn sometimes causes depreciation in value if sold for hay or if left too long before cutting.

Authorities: Frank A. Campbell, Bishop, ranch
16 $\frac{1}{2}$ mi. n. w.
R. Rossi, Big Pine, ranch 6 mi. n.
Anthony Rossi, Big Pine

EXTENT AND IMPORTANCE

Beans are fast becoming one of the most important crops of Inyo County in the Owens River Valley from Big Pine toward the north and also in Round Valley, where about 200 acres are this year planted to Tepary and Small Whites. Including both valleys there are in all close to 550 acres planted for the 1917 season. The Indians and Mexicans are in the majority in bean culture in this County.

SOIL AND CLIMATE

The sandier types of soil, mostly decomposed granite are most favorable to bean growing. While it has been the custom here to plant all the beans throughout the acreage to be put under cultivation at one time, it would in many instances save two-thirds of the crop if plantings occurred ten or fifteen days apart, so that when late and severe frosts come, the entire crop will not be devastated. This has frequently happened, especially in seasons of late spring following a severe winter.

COST AND METHOD OF PRODUCTION - VARIETIES

Beans are usually planted on raw land which is given deep plowing, harrowing, sometimes cross harrowing or spring tooth harrowing. About 40 lbs. of Kidney and 35 lbs. of White Navy beans are planted per acre in rows two feet apart at an approximate cost of 20¢ and 22¢ per lb. respectively. These prices are based on a 5 year average including the high costs of 1917, and it is the expectancy that with the existing market and crop conditions throughout the world, it may be many years before this price lowers or even becomes normal. 1917 was the first year that Tepary beans were planted in more than experimental tracts in Inyo County and growers were obliged to pay in the neighborhood of 75¢ per lb. for seed. Some Bayo and Pink Eye have been grown successfully in small tracts and home gardens. Preparation of the ground before

planting including labor of applying water for thorough flooding will cost about

\$ 2.90	for plowing
.85	" harrowing
.45	" spring tooth harrowing
.75	" labor of putting on water
<u>\$ 4.95</u>	per acre

It would not be fair to state even an approximate price for planting with the price of seed rising steadily. Cost of planting runs about 75¢ an acre with a 2 row planter and one man and double team will plant about 8 acres a day, cost \$6.00 per day. The majority plant about the last of April or the first part of May although in some of the mountain sections planting as late as the first of July have given good results and avoided all trouble with frosts. Some of the best results have been obtained with seed beans which come from northern Oregon. The progressive grower innoculates the seed prior to planting at a cost of \$1.60 per acre, Westrobac inoculator being the most largely used for this purpose.

CULTIVATION AND IRRIGATION

A thorough cultivation is given immediately after each irrigation and sometimes a second is quite necessary in a week or ten days time, if the weed growth is rapid. By the end of August the weeds begin to dry up and less cultivation is needed. It is, however, necessary to allow for at least four cultivations and as many irrigations. Cost of operating two-row cultivator is about 90¢ per acre. The first irrigation is by flooding and the following ones by furrow, costing for the flooding about 75¢ per acre and for the making and upkeep of furrows, putting on water, etc., about \$1.00 per acre per operation. The acre foot duty of water is at the outside about 2 acre ft. per year.

HARVESTING AND MARKETING

The Navy bean begins to mature about the 5th of September and the Kidney in October, as will the bulk of the Tepary. The crop is handled by a commercial bean thresher, although it is contemplated that one of the largest ranches under intensive cultivation in Inyo County will during the harvest season of 1917, install modern and highly efficient

threshing and cleaning apparatus, which may be used by the neighboring ranchers. Two cents per pound is the estimated cost of pulling and threshing. The chief markets are Los Angeles and Nevada and no equitable selling price can at this time be given, although prior to 1917 White Navy brought about 8¢ and the Kidney six cents per lb., for a five year period. Bayo about the same as Kidney. The bean straw finds a ready market among the sheep men at about half price of hay.

YIELD

Bayo will average about 800 lbs. to the acre conservatively estimated, and in many sections will run one ton to the acre; Navy about $1\frac{1}{2}$ tons per acre and Kidneys $1\frac{3}{4}$ tons per acre. The yield on Tepary beans vary from 800 lbs. to 1,850 lbs per acre.

Sacks are scarce and daily increasing in price, $12\frac{1}{2}$ ¢ for second hand sacks and 14¢ for new being the price asked in 1917. These are mostly wheat sacks and hold 150 lbs. of beans, taking all kinds for an average.

DISEASES, PESTS AND HINDRANCES

Much loss has been occasioned by watering the beans in the heat of the day when the patch is on sandy soil. The scald cuts the stem and the plant gradually withers and dies. Cutworms and aphids cause the general amount of loss. A blight which is thought to be a fungus growth has effected many patches. This is hard to do anything with but spraying with sulphur sometimes checks the loss. Bean thrips have not been a menace in this section as yet.

PRICE OF LAND

Raw land suitable for bean culture may be obtained for \$75 to \$125 per acre and old alfalfa land or that which has been previously cultivated to some other field crop may be had for \$150 to \$250 per acre and old alfalfa land or that which has been previously cultivated to some other field crop may be had for \$150 to \$250 per acre.

PROFITS

Cultural methods are too uncertain as is also the production to render an average profit per acre, but with a minimum amount of cultivation, care and attention in the matter of threshing and cleaning, the bean grower should realize at least a profit of \$125 per acre at the present price of this commodity.

B E R R I E S

Authority:- E.M.Nordyke, Horticultural Commissioner of Inyo Co., Bishop

EXTENT AND IMPORTANCE

Nearly all the berry shrubs bear prolifically and regularly in this section altho the season is late and the product of such small amount that outside of supplying the demand of nearby towns and the mining camps, little small fruit or berries are raised for outside commercial shipment.

VARIETIES

Gooseberries and currants are especially excellent here and are often used between the rows of orchard trees until the young stock comes into bearing. Hardly a well equipped ranch is without its quota of one if not both of these fruits.

Black, logan and raspberries are also grown with varying degree of success. With proper cultivation and pruning these berry varieties do especially well in the vicinity of Fort Independence, Manzanar, Lone Pine and Bishop, but few properly attend to the cultivation demands of this fruit here.

Strawberries while prolific bearers in the Owens Valley are small, of high flavor and color, inclined to be seedy and unattractive in appearance. They would not for any one of these reasons be profitable as shipment to the large city markets even tho they were raised in sufficient quantities.

CANNERY.

A small individually owned and operated cannery is maintained in the vicinity of Bishop and here is perhaps the largest unit of berry acreage in the County. The output from this concern is locally disposed of.

George Shuey, Independence
R.A. Wilder, Manzanar, ranch $1\frac{1}{2}$ mi. w.
E.E. White, Big Pine (Foreman Red Mt.
Authorities: Fruit Ranch 9 mi. s.w.)
J.L. Gish, Laws
J.K. Thomas, Bishop, ranch $1\frac{1}{2}$ mi. s.w.

EXTENT AND SECTIONS

Field corn on which the hogs of the County are finished is grown in nearly every section of Owens Valley, while the area for sweet corn is mainly in the southern end of the Valley.

CLIMATE AND SOIL

The climate seems especially adapted to heavy corn production, especially free from diseases and pests. The sandy loams on the mesas and well drained sections of the valley are best adapted to large yields. Corn on heavy land will not mature satisfactorily. Sweet corn matures in about 120 days and field corn in about $4\frac{1}{2}$ to 5 months from time of planting.

CULTURE AND PRODUCTION

Corn planting begins about the first part of May and for sweet corn plantings about every 15 days are made for $2\frac{1}{2}$ and sometimes 3 months, to keep a supply constantly ripening. Most of the sweet corn is raised between rows of young orchard trees and plowing costs about 50¢ more per acre than for the open field. A deep plowing of at least 8 inches is given which costs about \$2.50 per acre. 3 to 5 harrowings are necessary until the soil is in a well pulverized condition, at an approximate cost of 80¢ per acre, each operation. About 15 lbs. of sweet corn and 10 lbs. of field corn are planted to the acre. 2-row corn planter is used for rows, 2 or $3\frac{1}{2}$ ft. apart and distribution of seed about every 18 inches at the closest; cost about 58¢ per acre for labor and 2 ¢ per lb. for seed during the 1916 and 1917 seasons. No irrigation is given until the corn gets a good start and about the first part of July, three or sometimes four irrigations are given if the soil is particularly porous and the weather intensely warm, at a cost of about 30¢ per acre for the labor of putting the water on in furrows. While some raisers of small patches sucker the corn leaving two or three stalks to the plant, old and large producers assert that nothing is to be gained by

this and that the plant will of itself mature only what stalks it can support and make productive. Expense of suckering would run up the production costs per acre as one man can only sucker about 1/4th of an acre per day. Cost of production runs about as follows for field corn:

	<u>Per acre</u>
8" plowing	\$2.50
4 harrowings @ 80¢ each	3.20
10 lbs. seed @ 2¢ per lb.	.20
Planting, labor	.58
Labor, average 3 irrigations @ 30¢ per operation	.90
Total, not including taxes, interest, depreciation, price of land, rental, etc.	\$7.38

VARIETIES

White and yellow Dent are the varieties of field corn best suited to soil and climatic conditions here, while the Country Gentleman, Oregon Evergreen and Stowell's Evergreen are the favorite sweet corns. The latter seems best suited to large and steady production in the southern end of the Valley.

PRODUCTION AND MARKETING

It is quite important not to drown out sweet corn, a good moist soil condition maintained at all times but the amount and manner of irrigation must be carefully gauged and tended. About 1 acre ft. per season is the water average.

The sweet corn begins maturing the last part of July and the field corn is ready to harvest in October.

SWEET CORN

The principal markets for the sweet corn raised in Owens Valley are Keeler, Darwin and the mining camps throughout the White Mts. The season if there is absence of frost lasts about 90 days and the yield averages about 250 dozen ears to the acre. The ears are sacked with from 6 to 9 dozen ears to the sack. Picking, sacking, sacks and sewing costs in the neighborhood of 30¢ per sack if a fast workman turns out 20 sacks per day, with price of sacks at 15¢ each.

The patch is gone over about 4 times during the season and many of the corn raisers do not pick until they have contracts or orders from the local markets or camps, therefore truly reliable prices of harvesting are difficult to get, as the farmer or his family do all the work. About 34 sacks per acre is the average production and the average selling price has been 20¢ per dozen for the past four years in this section, f.o.b. ranch. Cost of harvesting and approximate profits on sweet corn would run about as follows:

Picking, sacking, sacks and sewing, on average yield of 34 sacks per acre @ 30¢ per sack . . .	\$10.20	per acre
Average 7.5 doz. ears per sack @ 20¢ per doz. on average yield of 34 sacks per acre, brings	\$510.	
Cost of production	7.38	" "
Total	\$17.58	" "
Yield	\$510.00	
Production & harvesting	17.58	
Gross profit	\$492.42	

F I E L D C O R N

Field corn is cut and stacked in shocks 2 x 14 ft. apart at a cost of about \$3. per acre. Allowed to dry a month or six weeks it is hauled to the corn crib and the ears stripped from the stalks; altho some farmers shell their corn the majority feed cob and kernels together. Much of this is soaked before feeding to hogs. Production runs about a ton to 1½ tons of shelled corn to the acre and the selling price for the past five years has averaged \$35. per ton including the high prices obtained for the 1916 crop. When the stalks are not used for ensilage they are fed to cattle and if the stripping is done in the field corn stalk pasture rents for \$2.50 to \$5. per acre depending upon the season's feed conditions. While much of the shelling is done by privately owned machines, a commercial sheller accomodates the farmer for \$6.22½ per ton of shelled corn, on the ranch. Gross profits and costs of harvest would then be:

	Per acre
Shocking	\$3.00
Shelling, averagel½ tons per acre	7.78½
Hauling, loading, cribbing	2.20
Approximate total	\$12.98½

Average yield $1\frac{1}{4}$ tons @ \$35. per	
ton	\$43.75
Average allowance for stalks . . .	3.75
" total per acre . . .	\$47.50
" gross production	12.98 $\frac{1}{2}$
" " Profit not includ-	\$34.51 $\frac{1}{2}$
ing taxes, interest, rental	
or depreciation, etc. per acre	

DISEASES, PESTS AND HINDRANCES

Cutworms, especially on the sweet corn have been the largest factor of loss here. Control is by poisoned bran spread around the young plants before the worms get headway. The corn ear worm is also troublesome on sweet corn. A late spring when the ground fails to warm up until late, is the most serious cause of non-production existant, however. Corn is particularly free from pests in this section.

Inyo County

CROPS G R A P E S

Authorities: E. M. Nordyke, Horticultural Commissioner, Inyo County, Bishop;
R. Rossi, Big Pine, ranch 6 mi. north

EXTENT AND SECTIONS

The commercial acreages of grapes lie in the Owens River Valley north of Big Pine. There are few growers who make this the important crop of their ranch although many farmers have a few vines for family use. The grapes are said to have an unsurpassed flavor although not producing two crops in the same season.

SOIL AND CLIMATE

The gravelly and sandy loams found nearly everywhere throughout Inyo County are very adaptable for the culture and raising of fine grapes. The late frosts are dangerous and in certain sections where the thermometer often stays at 28° through a succession of days during the winter and often descends to below zero, the vines have been frozen and cease to bear.

PRODUCTION, CULTIVATION AND VARIETIES

Prior to planting, the ground is given deep plowing followed immediately by harrowing at a cost of about \$2.50 and \$1.25 respectively. On hillsides the vines are sometimes set in terraces or contours at distance of about 4 x 12 ft., and on the gently sloping valley land 7 x 7 ft. or 720 vines to the acre. While about 53 different varieties of grapes are grown in this County, nearly any of them are obtainable for \$5.00 per hundred. Cost of planting averages about \$10.00 per acre.

The Emperor and Black Miroca ripen too late in this section and keep blooming all summer and are therefore not profitable here. The Thompson Seedless have not done very well here, especially in damp places, although they make an excellent shade vine for ornamental purposes, running to rank growth. The Muscat, Malaga, Tokay, Rose of Peru and Black Malvoisie seem best suited to climatic conditions here.

About three cultivations per year at a cost of \$1.00 each are given the young vines before time

of bearing, each cultivation being preceded by an irrigation, which will necessitate an expenditure of 75¢ per acre per operation of putting the water on. Bearing vines receive from three to five irrigations and cultivations at approximately the same cost. The bearing vines are suckered twice yearly. Cost about \$3.50 per acre each time. The amount of water needed depends very largely upon the character and condition of the soil. On hill-side vineyards the cost of irrigation is higher owing to the difficulty experienced in irrigation without washing, on the contours.

FERTILIZATION

When obtainable barnyard manure 10 loads per acre has been successfully applied every other year. This was not spread in the vineyard but a deep furrow plowed, filled with the fertilizer and a second furrow run parallel with the first, turning the earth over the fertilizer.

HARVESTING, MARKETING AND YIELD

August is the harvest month for grapes here and figures for picking and packing are hardly dependable inasmuch as the majority of the grape growers who do not use their entire output on their family table, pick only when orders come from the local markets and neighboring mining camps. The crop is all green shipment. 20 lb. boxes are used and the 5 yr. average price has not ranged over 5¢ per lb. or 75¢ per box in the local markets. About 1¢ per lb. for picking and packing is perhaps a fair estimate of cost. Ordinarily not over 5 tons per acre may be counted upon.

DISEASES, PESTS AND HINDRANCES

Birds are the primary pest of the vineyardist in this locality and if his acreage is not sufficient to meet the demands not only of these pests but of the markets, he is a loser. Winds are another factor of loss, breaking off the young shoots. Black knot attacks some of the old vines and it is necessary to dig this out or cut off the vine if not too close to the ground. There is no phylloxera present and

therefore non-resistant are the only planting.

It is necessary to sulphur for mildew two and sometimes three times a year at an approximate cost of \$3.00 for each operation. The first application is made in the spring when the vines are in bloom.

PRICE OF LAND

The price of raw land depends largely on whether or not water right goes with the property, for without this for the purposes of a vineyard, it is worth nothing. Land suitable for grape growing with water right may be had for \$75 to \$100 per acre and as the crop is not a commercially important one, it is doubtful if bearing vineyards without other crops planted on the ranch, could be obtained.

PROFITS

The profits on a vineyard in any locality are nearly always satisfactorily large, provided some disease or uncontrollable pest is not present.

P E A C H E S

Authorities:

E. M. Nordyke, Horticultural Commissioner,
Inyo County, Bishop;

Thomas Kehoe, Independence

Neel Bell, Independence, ranch 2 $\frac{3}{4}$ mi. n. w.

EXTENT AND SECTIONS

Around Big Pine and Independence, with recent plantings in the Sunland District outside of Bishop, are the principal peach raising sections of the County. The fruit is unexcelled in appearance and flavor and now that the acreage warrants the shipment of carload lots, it is thought that plantings will materially increase. There are 28,000 bearing and about 700 non-bearing peach trees in Inyo County.

SOIL AND CLIMATE

Peaches do not thrive in wet, cold ground and the warm, well aerated loams on the mesa stretches produce the fruit of sweet flavor and good shipping qualities. The climate is not quite so favorable and like all fruits except the apple and pear in Inyo County, the peach stands good chance of being caught in the severe frosts of late spring. For this reason the late blooming varieties are recommended.

SETTING OUT AND COST OF PRODUCTION

A deep plowing is given the land before planting followed by harrowing and the trees are set 24 x 24 ft. in late plantings although some old orchards are set 18 x 18 ft. with 118 trees instead of 76, to the acre. Setting out must not be done before the ground warms up during the first days of Spring and April 15th, is early enough. Holes are dug about 24 x 18 inches and the young tree is irrigated immediately after setting out. Stock is two year old root, either peach or almond, and costs about 27 $\frac{1}{2}$ ¢ delivered Owens Valley. Strict inspection of all nursery stock before setting out is practiced by the Horticultural Commissioner. The trunks of the young tree are wrapped in sacks or sometimes whitewashed to protect against the sun

P E A C H E S - Cont'dSETTING OUT AND COST OF PRODUCTION - Cont'd

and insects. About one plowing and thorough cultivation is given not only the young orchard but bearing acreages, per year. (For costs of plowing, etc., see "Pears, page _____"). From about the middle of February until September the orchard is irrigated about every 30 days at a cost of \$1. per acre for labor. Furrows are used by the careful orchardist although some flood in as many trees to the check as is possible without soil-washing.

PRUNING AND FERTILIZATION

After setting out the young tree is cut back 18 or 20 inches from the ground and as it is the inclination for the peach in this section to grow too rapidly, rather heavy pruning is advocated. Five dollars per acre per year is about the cost of properly pruning a young orchard until time of bearing and at least \$7.50 per acre after that time. About 2/3 of the growth in the young orchard should be cut out and in the bearing orchard this will not only shape the tree but give strength and vitality to the fruit bearing wood and make strong limbs.

While no commercial fertilizers are used in this section, probably on account of the high cost of transportation, about four loads of barnyard manure to the acre, well plowed under in the fall will materially increase the crop and help to keep the orchard in a rich condition of humus. No cover crops are grown although many grow alfalfa or clover in their orchards, cut for hay and plow in the stubble.

VARIETIES

Early and late Crawford, Alberta, Morris, a few Muirs, Triumph, Alexander, Tuscon Clings, Heath and Lemon Cling and White's Prize which is a very late bloomer, Sneed which is too early for this section and Strawberry which is a poor shipper, are the principal commercial varieties grown. Some Blood peaches are raised and sold at fancy price in the local market. This is a beautiful peach, rich blood red in color shading almost into purple with the leafage reddish green in

P E A C H E S - Cont'dVARIETIES - Cont'd

in color. They are a novelty fruit but would make exceptionally fine ornamental trees and do well in this section.

DISEASES, PESTS AND SPRAYING

The codling moth and green aphid are the chief pests in this County. White arsenate of lead is used for the moth and black leaf 40 with emulsion of soap for the aphid at a cost of about \$6.50 per acre per operation for either. Labor and materials included in this price and about two sprays a year are necessary. Peach leaf curl is beginning to manifest itself here and the season of 1917 saw vigorous control measures applied.

HARVESTING AND MARKETING

The season is about a month behind the interior valleys and the crop begins to move about the last of June, more often the first half of July. Season lasts until October. The fruit is shipped in 25 lb. boxes and one man can pick and pack about 18 boxes a day and help is now paid \$3.00 and their dinner. Few market enough to have regular packing sheds and the majority of the growers do all their own work or sell the crop outright on the trees to some of the neighboring farmers. Boxes are higher in price the past two seasons by 2-3¢ each than prior to that time. They come from Truckee and cost the peach grower about 8-9¢ knocked down at the mill. It is estimated that it costs about 19¢ per box to pick and pack peaches, not including price of box which will average about 12¢ each f.o.b. Owens Valley points. The orchard is picked over about four times during the season.

YIELD AND SELLING PRICE

The yield throughout the County will run about 4½ tons to the acre and the price received here does not depend so much upon the price being received in other sections but upon the crop and the extent of the demand. Chief markets Los Angeles, Nevada points and the mining camps in the County.

YIELD AND SELLING PRICE- Cont'd

These latter always pay fancy prices and expect the best and they generally get it. Prior to 1916 the crop brought about $3\frac{1}{2}\%$ per lb., but the past two years has averaged $8\frac{3}{4}\%$ or 80% per 25 lb. box. About 20% of the crop is dried and mostly used during the winter on the table of the grower. When local demand is supplied and the amount of the crop picked, then is the only time that the peaches go on trays for drying. No very complete equipment is found at any of the ranches for this and the methods employed are very primitive. Birds get a good deal of the drying product.

VALUE OF LAND AND PROFITS

Unimproved land suitable for peach planting may be obtained with water right for \$175 per acre up. The plantings are so small that either price for bearing orchards or net profits per acre, would hardly be accurate if given and of no material help in determining the advisability of raising this fruit here.

Authorities: E. M. Nordyke, Horticultural Commissioner, Inyo County, Bishop;
C. C. Neel, Independence, ranch
2½ mi. n.
I. L. Hatfield, Manzanar, ranch ½ mi. w.
W. A. Sanger, Big Pine, ranch 1½ mi. s.
W. H. Alcorn, Manager, Red Mountain
Fruit Ranch, Big Pine ranch 9½ mi. s.w.

EXTENT AND SECTIONS

Based on the performance of old orchards in Inyo County, there have been heavy plantings to pears throughout every section where it is possible or profitable to raise fruit. Many hill orchards nestled at the base of the Sierras, are doing finely with plantings on raw land and it is safe to suppose that pears will eventually be the leading fruit crop of the County. There are now in bearing about 14500 trees in the County and 3,150 non-bearing. The heavy yield, health, appearance and quality of the pear raised in this section is ample assurance of its successful future.

SOIL AND CLIMATE

The pear is a late bloomer and avoids the danger experienced by other fruits in this section from heavy and late frosts. It will tolerate a minimum amount of alkali and will grow and bear with its "feet in the water", favoring the heavier type of soil on which other fruits would not survive. Some of the best bearing orchards here are on heavy black adobe and have received little or no cultivation during many years. For this reason their crop is erratic but the trees are healthy and the quality of the fruit excellent.

COST OF PRODUCTION

To clear and level sagebrush land prior to the planting of a pear orchard will run from \$12.00 to \$15.00 per acre and for the heavier types of land found in the low part of the Valley as high as \$30.00. At least \$2.50 for plowing in sandy soil and \$3.00 in heavy types per acre must be allowed, followed by harrowing generally with a spring tooth harrow at a cost of about \$1.00 per acre average for all types of soil. Many of the bearing orchards are planted 20 x 20 ft. or 108

trees to the acre, but the crop is heavy in this section and tends to weigh down the branches making them spread and the trees grow large and rapidly, so that plantings of the last few years have been mostly 24 x 24 ft. or 76 trees to the acre. Only in a few of the orchards of the progressive and cautious farmer has blight-resistant stock been planted. This is one year old tree on a 2 yr. old Jap or French pear root and the cost is about 27¢ per tree for resistant stock or 15 to 18¢ for ordinary pear on a pear root nursery stock. Holes are dug about 24 x 24 inches and these setting out the trees and filling would run about 15¢ per tree. An irrigation is given immediately after planting to pack the earth more securely about the roots and the cost of this properly done would run high as great care must be exercised. No water should be allowed to stand on the surface around the tree for in this climate scalding takes place. Some paint the trunks of young stock with whitewash or wrap in one layer of burlap as protection against sun and insects. One man can paint about five acres of young trees per day. This, however, is optional and sometimes tends to make the young tree too sensitive against the time when the wrapping is removed. Necessary costs of planting an acre of pears, would therefore be about as follows, on raw land:

Per Acre

Clearing and leveling, marking for trees minimum.	\$15.00
Plowing, average, type of soil.	2.75
Harrowing, spring tooth harrow.	11.00
76 blight resistant trees @ 27¢ per tree	20.52
Digging, planting and filling 76 holes @ 15¢ each.	11.40
Labor of first irrigation, average.	1.50
Approximate total per acre.	\$52.17

CULTIVATION AND IRRIGATION

The pear comes into small bearing about the sixth year and produces its first full crop about the 8th or 9th year. The trees in this section, like the people, are long lived and hardy. Immediately after setting out the young tree is topped back about 18 inches from the ground and the cost for the first four years for pruning should not run

over \$1.50 per acre per annum. Little or no effort is made here to prune old bearing orchards and many reach an enormous height for pears, making the harvest more expensive and the strength of the tree go to wood instead of fruit production. \$3.80 per acre per year may well and profitably be expended on bearing orchards for pruning. While many orchardists in Inyo County laugh at the idea of cultivation and assert that the soil in their orchards when packed and baked through years of non-acquaintance with plow and harrow, does not in any way affect their crop of pears, if taken off their guard at another time they will invariably voice the woes of irregular bearing, falling off in production, etc. The large acreages to fruit in Inyo County have been planted mostly by young and ambitious men who have come into the country during the past ten years with firm belief and experience in modern and semi-scientific methods of farming and whose tireless round of cultivation, proper irrigation methods and cultural activities show the extent and strength of their convictions. Several of these farmers advocate from six to ten irrigations followed by cultivation per year, for the pear, the last when the fruit is just commencing to ripen in order to size up the crop. The first irrigation usually comes in May or earlier if the weather turns warm.

Two years ago saw the first cover crop grown in Inyo County in a fruit orchard. White clover, alfalfa, Melolitus, rye or barley may readily be grown and one grower indicated his desire to plant Canadian peas next season as cover crop. Some fertilize by use of green manure plowed in, in the spring. Others apply eight to ten loads of barnyard manure. Seasonal irrigation and cultivation costs would therefore run about as follows on a bearing orchard:

Spring plowing.	\$2.75 per A.
7 harrowings @ 75¢ each (smooth tooth harrow).	5.25 " "
Labor of turning furrows and putting on water for 7 irrigations per season	5.25 " "
Spraying 76 trees @ 15¢ per tree. . .	11.40 " "
Pruning 76 " " 4¢ " "(minimum)	3.80 " "
Total average	\$28.45

PESTS, HINDRANCES AND DISEASES

Although there has never been any pear blight in Inyo County, the codling moth and aphid have proven very troublesome and spraying for them is practiced twice a year. Among the old type of mountain rancher whose fruit orchard might be alive with codling moth or aphid, the matter of winning his cooperation, much less his active interest in ridding his orchard of pests or diseases and the protection of his neighbor's orchard, has been one of the most monumental tasks of the Horticultural Commissioner and the new settler who has perhaps staked his "all" on an adjoining acreage.

Red spider occasionally necessitates spraying at a cost of about \$11.40 for lime-sulphur; \$6.50 per acre for black-leaf 40, for aphid. The latter is often mixed with emulsion of soap and this is extremely beneficial for old orchards, if used at least once every other year, to loosen the bark and generally stimulate the healthy growth. It is often necessary to spray three or more times a year for the codling moth.

VARIETIES

Winter Bartlett and Winter Nellis are the two largest grown varieties, although there is a sprinkling of Summer Bartletts, Sugar Pears and a few Keefer. The latter do not bear regularly or extremely well here, however.

HARVESTING AND MARKETING

The crop commences to move about the first of September and the season lasts for about a month or six weeks. The principal markets are San Francisco, Los Angeles and the Nevada towns. The canneries in the larger cities take some of the crop which goes to this market in 70 to 80 lb. boxes, but the bulk of the crop is sold in carload lots exclusively as green shipment. Most of the ranchers pick their own crop to fill contracts and costs of picking, packing, boxes and hauling to shipping point are hard to obtain, but it is estimated that about 28¢ per 40 lb. shipping box is the lowest cost at which this may be done. Price of boxes is steadily increasing. Most of those used in this section come

from Nevada shake and box mills. Pears and apples are the only fruits which move in carloads lots out of Owens River Valley and vie with each other in agricultural importance throughout this district. It is general practice to turn hogs into the orchard to clean up after the season is over, but it is acknowledged that this is neither good for the hog or the orchard.

YIELD AND SELLING PRICE

Some record yields have been reported for pears in this section, but taken throughout the County about 6½ tons per acre is the average production. The price for the past five years which include two high years of large production and two poor paying years, one of which had extremely small production, has been about \$25.00 per ton to the grower f.o.b. shipping point. This means a haul of at least four miles unless the orchard is located in the vicinity of the railroad station which very few of them are. One grower reported a yield of 1,400 - 40 lb. boxes off two acres of 20 year old trees. This, however, is exceptional and from one of the finest orchards in the County.

PRICE OF LAND AND PROFITS

Raw land with water right will run in the neighborhood of \$75.00 per acre. Some of this is old alfalfa land; little of it, however, has been leveled or stoned. Improved orchard land with stock not yet come into bearing averages about \$200. per acre with a proportionate increase of about \$75.00 per acre per year until time of bearing and bearing orchards when obtainable would bring from \$500 to \$700 per acre depending upon type of soil and condition of the trees.

Many pear growers estimate that \$200 per acre per annum is a conservative profit in this section, but it must be remembered that most of the farmers here count their own time as worth nothing and do a greater part of the work of cultivation, picking and packing themselves.

POTATOES

George Shuey, Independence
R.A. Wilder, Manzanar, ranch $1\frac{1}{2}$ mi. w.
E.E. White, Foreman Red Mt. Fruit
Authorities: Ranch; Big Pine 9 mi. s.w.
J.S. Gorman, Independence, ranch 2 mi n.
A.E. Gish, Laws

EXTENT AND SECTIONS

There are about 1,500 acres devoted to potatoes throughout the County and hardly any ranch is without its few rows if not a large patch.

SOIL AND CLIMATE

The late blooming varieties seem to do best in this section as the danger from late frosts is avoided. The light sandy loams are most productive and few have made a success of raising on the heavier types of soil.

CULTIVATION AND PRODUCTION

After a deep plowing and thorough cultivation the potatoes are planted about the last of April or the first part of May, 800 to 1,000 lbs. of seed being used per acre. Few disinfect seed altho it has been found most essential during the past two seasons. Formaldehyde, 1 pint to 50 gals. of water is the disinfecting strength to insure clean seed. Planting in the large acreages is done with potato planter in rows 3 ft. apart and a distance of 12 inches between plants, at a cost of about \$2.50 per acre. About four irrigations are given beginning when the plant gets a good start and at intervals of approximately every 10 days or two weeks. Sandy soils require more irrigation than the loams but the cost of tending furrows and putting the water on, will average about \$2.50 per acre all types of soil, per crop. Two or three cultivations are given and constant weeding until the plants get too large to be choked out, are necessary at an approximate cost of \$4.00 per acre for this service, up to time of digging.

VARIETIES

The short top Burbank, Russett, Peerless and Rural, which is just beginning to be prime favorite in this section of the State, are the chief varieties grown. Peerless provide the first crop

dug for new potatoes and are ready for an early market compared with the other three varieties. Seed for Russett obtained from Idaho.

HARVESTING AND MARKETING - YIELD

About the first of July the harvest begins and digging after hilling up, and sacking in the field will cost in the neighborhood of \$2.00 per ton to dig and sack. Second hand sacks 1917, are held at 12¹/₂¢ each. If the crop is handled with a machine digger, a crew of four men can turn out about 800 sacks a day or 4 tons. The yield runs about 9 tons per acre, every potato raising section of Inyo County.

The local demand takes the bulk of the potato crop and the remainder is shipped to Darwin, Keeler and the mining camps of Nevada.

The sacks filled weigh about 110 lbs. each, and the average selling price for the past five year period has been about \$30. per ton with a net profit of about 30 to 40% to the grower.

DISEASES, PESTS AND HINDRANCES

Some scab has been apparent in this locality and the growers are realizing yearly the necessity of dipping seed potatoes in order to properly guard against this loss. Some indications of Rhizoctonia has also manifested itself especially in the sandier types of soil. As on all other crops of the County, potatoes suffer some loss from cut worms and aphids and in some sections where no control measures have been employed, the gophers play occasional havoc. No wilt or eel worm found in this section.

PRICE OF LAND

Raw land is seldom used for potato culture as the humus is not present in sufficient quantity to insure a substantial yield. Old alfalfa land makes the best potato patch and is worth from \$150. to \$200. per acre close to towns and from \$100. to \$175. outside of a mile radius of these.

POTATO CELLARS

Most of the raisers of large crops have a

potato cellar or bin. One of the improved types of these was excavated about 6 ft. underground. Dimensions about 60 x 14 ft. The center pole was 11 ft. in height with the side stud beams 8 ft. high. Roofed and timbered roughly on the inside. Sod and straw roof. Cost of construction about \$250. including labor and material.

Here potatoes might be kept nearly a year without fear of mildew or sprouting. Smaller and less expensive cellars are to be found but built practically upon the same general plan.

SUGAR BEETS

J.W.Collins, Field Supt., Holly Sugar
Co., Huntington Beach, Calif.

Fred M. Hess, Bishop, ranch 2 mi. s.

Authorities: F.E. Turner, Fort Independence, ranch
2½ mi. north

EXTENT AND SECTIONS

Upon the performance of several acreages in 1916, none of which averaged over 5 acre tracts each, between 400 and 500 acres of sugar beets were planted in Owens Valley in 1917. The analysis of the beets raised here last year goes to prove that the hot days and cool nights are ideal for high percent of sugar, rapid and satisfactory maturing of the beet in this section. Owens Valley is declared by experts to be similar in altitude, climate, irrigation and soil conditions, to the famous Greeley District, which made Colorado one of the largest sugar beet producing sections in the U. S. It is therefore anticipated that this locality will come into prominence for the high percentage of sugar and the heavy yields of its sugar beets, when the labor and transportation difficulties which beset the path of all new enterprises, are overcome.

PLANTING AND CULTIVATION

Planting should be about the 15th of March to the 15th of April, 20 lbs. of seed worth 12½¢ per lb. are used to the acre; planted with 4-row drill, 18 to 20 inches apart, at a cost of about \$6. for labor and \$2.50 for seed, per acre.

Many of the sugar beets in this section are planted on raw land, the thorough preparation of which includes cross plowing, harrowing and enough cultivation to produce and maintain finely pulverized soil condition. This costs about \$9. per acre and \$11. per acre for the preparation of old alfalfa land. Cultivation should take place every week or ten days after the plant shows 4 or 5 leaves, at a cost of about 50¢ per acre, each operation. It is safe to suppose that one man with two horses and a 4-row cultivator earning \$6. per day can cover at least 10 acres per day. Thinning and weeding are done prior to the first cultivation, and when done at the same time costs about \$5. per acre, for the first time that the patch is gone over. About two other hoeings and weedings are necessary before maturity and these

will approximate \$3. per acre apiece. The first irrigation is generally given after the initial thinning and weeding, with cultivation following immediately. Much time and money is saved if the hoer follows the weeder.

It is well known that the sugar beets highest in sugar are not irrigated until the plant positively needs water. It is thot about 2 other irrigations should be given throughout the season, tho' this is a matter largely of conjecture, due to inexperience with the crop here.

CROP CONTRACTS

The Holly Sugar Company of Huntington Beach, California, have furnished the seed, sent in Mexican labor, beet farming machinery and have contracts for the entire crop of the Owens Valley at a price of \$4.50 per ton for 15% beets, with a guarantee of 30¢ per additional 1% sugar content. In addition to this a participating profit based on the market price of sugar is enjoyed by the growers here, wherein if the market price rises, the price of sugar beets will be raised in ratio as high as 25% increase.

LABOR, TRANSPORTATION AND HARVESTING

The problem of sufficient labor to handle the crop at the imperative time when thinning and intense cultivation will be necessary, is the gravest danger confronting the raisers here as elsewhere, until unsettled conditions induced by the war are at an end. The season of 1917 a crew of experienced beet men were sent in from one of the large districts in southern California, but these were insufficient to handle the crop with the expedition necessary and some acres were lost through too late thinning. They began at the northern end of the Owens Valley and worked toward the south. It is therefore to be expected that the beets in the section last thinned and weeded, if profitable at all, will not be a fair criterion by which to judge the production of the crop in this county. Intensive cultivation is as yet too new here, to be quickly applied or appreciated but this is a condition which will automatically adjust itself.

The Southern Pacific agreed to handle

a crop of about 150 tons per day at a rate of \$1.75 per ton on beets from Owens Valley points to Huntington Beach and the Holly Company has agreed to pay \$1. of this, leaving a balance of 75¢ for the grower to pay.

The beets mature about September and yields based solely on the experimental acreages of last year, hold hopes of 18 to 20 tons to the acre. The sugar beet here will tolerate nearly 1% white alkali but no black alkali.

PESTS, HINDRANCES AND DISEASES

No serious hindrances or diseases have so far manifested themselves. Rising water table in several patches situated on the floor of the valley have drowned out portions of the field.

PRICE OF LAND

Old alfalfa land suitable for sugar beet culture may be obtained for \$150. per acre with water right. Unimproved land for \$100. up. It has been the experience in other beet raising sections of the U. S. that land proven good for sugar beets increases about \$75. per acre per year, in value. Sugar beets would best be rotated after two or three successive years continued planting, to some other crop.

Costs of plowing out, topping, harvesting, etc., not obtainable at this time but will be supplied for this report after the harvest of 1917.

BY-PRODUCTS

If the raising of sugar beets proves a success in this locality, the use of the beet tops will become a very important item in the balanced ration both for dairy and beef cattle and it is logical to predict that the dried beet pulp will come into favor also, for this purpose.

Authorities: E. E. White, Foreman, Red Mountain Fruit Ranch, Big Pine, ranch $9\frac{1}{2}$ mi. s. w.
J. L. Gish, Laws
Mrs. J. L. Polk, Independence
Mrs. George M. Wells, Manzanar,
ranch $1\frac{3}{4}$ mi. s. w.

EXTENT AND SECTIONS

Nearly every kind and variety of truck and vine crop does well in Owens Valley, producing product of unsurpassed flavor and excellent appearance. Little incentive is afforded the man who would raise truck or melons on a large scale here, however, as nearly every rancher and householder in the towns, raises enough for his table and the markets throughout the mining districts, while always prepared to pay fancy prices, are limited. Transportation rates for small shipments either to Nevada points or Los Angeles markets, are prohibitive.

SOILS AND CLIMATE

The soils of the lower mesa lands, mostly gravelly and sandy loam usually rich in humus and on the valley floor where drainage is good and no alkali present, are suited to maximum production. Inasmuch as the winters are severe and the ground does not warm up until late in May, the plantings are late in all classes of vegetable and small fruit acreages. The successful raiser of tomatoes, lettuce, onions, melons and the more tender plants, lays his seed in a hotbed and transplants. The size and quality of the product warrants this extra labor beside insuring the life of the plant against the frosts which often come as late as May. Radish, parsnips, carrots, all the cabbage family, onions, Casaba, canteloupe and watermelons, tomatoes, potatoes (See page), everything in fact except asparagus is raised successfully here.

Mountain fruit and vegetables seem to have a finer and more delicate flavor than those in the large interior valley sections where so much more irrigation is used.

B E E S & H O N E Y

W. Muth-Rasmussen, Independence, ranch
3 mi. n.w.

W.A. Trickey, Bishop, Apiary $\frac{1}{2}$ mi. w.

Authorities: J.P. Smith, Manzanar, " $\frac{1}{2}$ " s.w.

Neel Bell, Independence " $\frac{1}{2}$ " n.w.

A.W. Eibeshutz, Independence

EXTENT AND SECTIONS

There are in Owens Valley nearly 5,000 colonies of bees and the production of honey is here one of the most important and increasing industries. The climatic and feed conditions seem particularly adapted to the production of a clear, very thick, almost white comb honey and at several of the large fairs and Worlds' Expositions the product of Inyo County has been awarded grand prize with gold medals. On account of the desirable grade of the comb product, little extracted honey is shipped.

COST OF STOCK AND EQUIPMENT

Stands with two supers, to contain the surplus honey may be purchased for \$5. to \$10., but the average price throughout the County is \$7.50. Through a central purchasing agency connected with the Beekeepers' Assn. of Inyo County, which has perhaps more members than any other industrial organization in the County, the supplies for the apiaries are bought in car-load lots at greatly reduced price. The individual apiarist purchases direct as his need requires from this agent. The following prices therefore are f.o.b. Bishop:

Frames	3¢ each	Brood comb foundations	each 55¢
Surplus foundations	60 to 70¢ per lb.	Separators per 100	\$1.25
Shipping cases		Hives	2.75 up
per 100	\$15.00		
holding 24 sections	)		

Whenever possible orders for the season ahead are given and in this manner the supply may be ordered in advance of a market, which during the past two years has been steadily increasing in price.

BREEDS AND FEEDS

The Italian bee is the favorite and has the reputation of being a tireless and heavy worker. About half the bees in the County are the German Black bee and many hybrid Black and Italian colonies are found. Some Golden and Caucasian are also represented. The hybrid bee puts a white cap on the comb and their work is easily distinguished.

Alfalfa, white and red clover and the natural sweet clover are the chief feeds. The apiarist must in some cases, seek locations where such crops are produced in order that his bees will not be obliged to travel too far to gather nectar and in so doing exhaust their strength and longevity. The wild buckwheat is another food that produces desirable honey. The bee will average about 200 trips to one acre of full flowering plants in a near locality.

MANAGEMENT

As the country becomes more settled the industry is bound to increase and there will be more bees and beekeepers. In years gone by, while ample opportunity afforded for the production of honey of the finest quality, the transportation rates were prohibitive of small shipments at a profit and local demand and that of the neighboring mining camps only, had to be met. Now buyers seek Inyo County honey and shipments are made in carload lots.

Ramodos or shelters open on all sides and roofed with straw, brush or leafy branches protect the hives from the intense heat of summer. By doing all the work himself, one man can manage about 300 stands efficiently with extra help two or three months of the year. Helpers receive from \$50. to \$60. per month and found, if they are experienced. A novice is but small assistance. \$4. per day is the price paid to labor for gathering honey from isolated mountain apiaries.

COST OF PRODUCTION, YIELD AND SELLING PRICE

The honey from this section is very thick and rich, therefore the cost of extraction is higher in proportion to the profit than the comb

product. Extracted honey is however, becoming more popular and shipment was made this year from Bishop of large quantities. Under present and more scientific management the production per hive has increased 100% during the past half dozen years. The comb honey producing sections of Inyo County hold the State record for high production. About 300,000 sections of honey is the maximum yield for the County per annum. Under the State Law of Weights and Measures, each section must average about 13 oz. net weight. This means over 30,000 lbs. net of honey and wax shipped yearly. A failure of the honey production has never been known. It is estimated that about 7¢ per lb. is the cost of production including care and supplies. The selling price for the past four years has averaged around 9¢ per lb. f.o.b. shipping point, to the beekeeper. Each hive averages about 50 lbs. production under normal conditions and good handling. Frames and comb sections must be bot every year and the man who extracts must buy 5 gallon cans for shipment of the honey, in addition to the expensive extracting machine. The product is handled by the jobbers. Comb honey sells in three grades, Fancy, Number 1 and 2. The Fancy is the whitest and best in appearance. About 90% of the value is the appearance.

DISEASES, PESTS AND INSPECTION

American foul brood has been a menace for some seasons past and recently European foul brood has made its appearance. The only treatment administered here, is complete cleaning out of the hives and constant watch for any reappearance either in that hive or others in the apiary. The Beekeepers' Association has an inspector and three deputies who constantly travel through the County inspecting for disease and advocating treatment. If after thorough cleaning of the affected hive, indications are found the colony is destroyed. No bees are admitted to the County without inspection and no original hive or combs are allowed shipped in. Practically every honey producing county in the State has been forced to adopt these measures as protection against foul brood. After a hard winter when spring does not come in warm with decided change of season, the foul brood seems more apt to be rampant.

Bees should be packed in this section

during the severe winters and sometimes if the field crops are late in blooming, it is necessary to feed the colony honey in order to preserve the vitality of the brood until such time as they may get sustenance from the fields. Another purpose of the Association, which is now split into two factions with headquarters in Independence and Bishop, was to affiliate the apiarists, so that prices received for the production might be the same for every beekeeper and no one market independently at less figure.

Moths are another destroyer of the bees. The Italian seems better able to protect itself against this menace. This moth lays its eggs in the joints of the hives and the larvae burrow through the wax and frames, leaving in the latter deep indentations. This pest is another reason for keeping the colony strong and the hives clean, as full grown moths feed on the young bees. Birds and skunks also prey on the honeybee here.

PROFITS AND PRICE OF SUITABLE LAND

Barring disease, the profits from an apiary where the beekeeper does most or all of his own work, should be about 50% net and land in the vicinity of alfalfa and clover fields, suitable as a site for an apiary, sells for \$100. to \$150. per acre. There are about 100 beekeepers in the County, about half of whom handle their colonies without assistance except during the rush season and 10% of whom are devoting their entire time to the industry.

DAIRYING

W.W.Watterson, Bishop

Fred M. Hess, " , ranch 2 mi. s.

B.C.Cormode, " " 3 " " e.

Wm. Rowan, " " 3 " n.

Authorities: J.E. Roberts, Jr., Round Valley

Willard Ahrens, Big Pine, ranch 6½ mi.
southEXTENT AND SECTIONS

The chief dairying activity exists in the neighborhood of Bishop, Big Pine, Lone Pine and Round Valley, where is established one of the oldest dairies in the County. Dairying combined with hog raising has been increasing in importance for the past three years and bids fair to become one of the County's most lucrative industries. All conditions are favorable and with the increased dairy production the one drawback which now exists in the matter of transportation in refrigerator cars, will be removed. This is fully discussed in the last of this article, under the caption "Creamery".

COST OF STOCK AND EQUIPMENT

Ranchers who are breeding for high production from good blood lines, as a rule will not sell heifers unless pinched in feed shortage or unable to raise enough hay to supply their herd during the winter months. Heifers bring all prices and the majority of dairymen who have started with limited means, have made beginnings on herds of extremely poor grade dairy cows. The Durham strain is found throughout nearly every herd in the County, unless effort and money in large amounts has been expended to bring in only purebred cows and bulls. The figures quoted below therefore might not apply in the event of a hurried purchase, for they were obtained either from men who had imported all their dairy stock and bred from them, or from dairymen who had taken plenty of time to look about and purchase at their leisure when opportunity for stock at a bargain or disbursal sale occurred.

<u>Description</u>	<u>Grade</u> per head	<u>Purebred</u> <u>Regis-</u> <u>tered</u> <u>per</u> <u>head</u>
Heifers coming fresh	\$50. - \$60.	\$100. up
Age cows	75. - 125.	150. "
Bull calves	Market price for veal	120. "
Heifer "	\$25. - \$45.	75 "

Most of the milking barns are tamped dirt floor with two rows of feed yokes running down either side. Recent construction has favored the single line milking barn, as affording greater protection to stock during the storms of winter. 32 x 70 ft. milking barn, accomodation 30 cows, patent feed yokes, etc., may be constructed at a cost of about \$400. Concrete floor costs about \$100. additional. Separator, pails, etc., for string of 30 cows, averages about \$150. delivered in the Valley.

BREEDS

Holstein, Jersey and Ayshire purebreds are found throughout the County's herds but there is a very strong tendency to mix the Durham with every breed. This has proved especially practical and profitable with the Ayshire, for the bull calves mature rapidly and the dressing percentage is almost as high as purebred or range beef breeds. Long twos will average 1140 to 1160 lbs. and are good foragers and do well on rough pasture or range. They are beside, much more tractable to handle than either Jersey or Holstein steers. The heifers are healthy, hardy and give good production on rough or poor quality of feed in time of necessity. Some of their averages of production touch those of the Holstein grade, both in quantity and generally in butterfat content, run higher. Not many grade bull calves, other than Ayshire-Shorthorn are raised. Local butchers or the farm table if the ranch is a large one, take the supply.

With careful choice the breeding of the Ayshire-Shorthorn cross offers limitless possibilities to the scientific dairyman.

FEEDS AND SILOS

Dairy herds are pastured the year thro

DAIRYING - 3

with the exception of about 3 or 4 months during the storms of winter, when they are sometimes housed over the more severe periods and hay fed. Feeding costs will average lower in Inyo County than any other section of California in proportion to the butter fat content of the milk.

One progressive dairyman in the vicinity of Bishop broadcasts throughout his meadows, equal parts of Kentucky Bluegrass and sweet clover seed, which averages \$3. per acre for seed. This makes rich and succulent pasture and volunteers thickly each year without cultivation. It will not grow however, where water stands too near the surface.

The average hay ration for the milk herd is about 30 lbs. of hay per day and for the stud bull about 40 lbs. Dairy men who have gone thoroughly into the subject and whose stock are particularly healthy and productive, both of milk and calves, favor grain hay with alfalfa hay in equal parts. Their results are eminently satisfactory.

About 22% of the dairy ranches in Inyo Co. have silos and Indian corn is usually the fill. Little chopped alfalfa has been used for ensilage or forage grasses which are naturally adapted to this section, raised. No sorghums other than corn grown. The erection of silos is steadily on the increase throughout the dairying sections and 1917 sees the coming of newer and more improved methods of feeding and feed conservation for dairy cattle. Most of the silos now building run about 110 tons capacity and cost about \$400. for material and labor. This is for wooden stave type. Concrete is becoming more popular owing to the tendency of the wooden silo to warp during the heat of summer. From the books of one herdsman who has kept accurate account of all costs, production and profits, it is estimated that 18¢ per head per day for herd of 30 cows was the approximate cost of feeding, during the year of 1915. This year, 1917, this has increased over 200% or 36¢ per head per day. This dairyman raises all his own feed and gives about 25 lbs. of hay and 2 lbs. of ensilage to each cow daily, during the milking season.

PRODUCTION AND MARKETING

The county is negotiating for a herd testing

association and when that is installed, figures of production for herds of various breeds will be more accurate and readily obtainable. Only in odd instance are any records of milk weights and production per cow, kept. One Holstein grade herd averaged for a season when 30 young heifers with their first calf were being milked, .53 lbs. of butterfat per day. Three Jersey grade aged cows from another herd went 1.2 lbs. of butterfat for a period of 9½ months. Three purebred, registered Ayshire cows produced from 40½ to 50 lbs. of milk per day, which ran about 4.2 butterfat, for a period of 9 months. Several herds of Ayshire-Shorthorn grades produced an average of 34 lbs. of milk per day which ran about 3.9 in butterfat.

The milk in most instance is separated on the ranch and the cream sold to the Bishop creamery; skim milk disposed of to neighboring hog raisers if the dairyman has no swine of his own. One dairy in Round Valley makes butter for the nearby camps of the tungsten mines.

One herd of ten Holstein grades brought \$11.90 in cream checks for one month during 1917, not including the sale of skim milk this would indicate a gross profit of 82¢ per head. Skim milk value just about balanced the feed cost and would make yearly profit in the neighborhood of \$8.20 per cow per annum, not including the sale price of her calf, if she were milked about 10 months of the year, which is the average milking period for herds here.

The calves should be taken from their mothers at birth and fed skim milk, followed by dry alfalfa hay until 3 or 4 months of age, before they are turned out to graze. The calf mortality averages about 20% in grade herds and slightly lower in purebred.

DISEASES, PESTS AND HINDRANCES

Contagious abortion has been the principal cause of loss and many of the dairymen are careless of the fact that this is a disease which must be scientifically investigated and controlled in the herd if large loss and poor producers are not to become the rule. Many

prefer to believe that the major part of calf loss is due to goring by other cows and with few exceptions little has been done to eliminate loss from this cause, although the greater part of calf mortality is due to this. Scours among young calves is common but not generally found where dry feeding is maintained, at least three or four months before turning onto green feed.

Blackleg is also another serious problem here and many of the fields are infested. Vaccination is practiced with gratifying results in many herds. Blackleg has a preference for fat yearlings and 2 year olds and epidemics when sometimes 30% loss was sustained, have not been infrequent. The string and pill vaccination treatment with beef cattle and the hypodermic and pill method with dairy cattle, are the most widely used for blackleg prevention.

In seasons wild parsnip and larkspur have caused loss. The parsnip especially is a common form of hindrance during the early summer months. It grows in marshy places and the roots when the milky sap is flowing are sought by the cattle. Later in the summer the plant dries and becomes unpalatable to the stock. Dairy and cattle men should acquaint themselves with the foliage of this plant and make thoro inspection of their meadows and grazing grounds before turning the stock out to feed, as it is most rapid and deadly in its work.

State sanitary inspection is monthly and little tuberculosis has ever been found in the herds of the County. With the building of better milking barns sanitary conditions will doubtless improve still more. Some of the small herds are still milked in the corral.

RENTAL AND PROFITS

There are not many dairy ranches for rent and such as are include use of living house, milking barns, separator plants, etc., as well as the herd. These opportunities are so infrequent that any set price or conditions of agreement, are not obtainable. While the feeding costs here are lower than in other parts of California where alfalfa is the main hay crop, it is estimated that a net profit of \$7.50 to \$12. per head yearly, is a

fair figure. So many "boarders" are milked that the average production per cow according to the figures furnished us by the Creamery, is considerably lower than it should be if the quality of the dairy herds throughout the County was brought up by weeding out the non-producers.

C R E A M E R Y

Authority: E. L. Dilley, Manager Inyo Cooperative Creamery Company, Bishop

At Bishop is situated a cooperative creamery with capacity of 1,100 lbs of butter per day, although the output during the summer months ranges between 850 and 900 lbs. The following table of output in butter will convincingly give accurate and indisputable evidence of increase since 1914.

<u>Year</u>	<u>Output lbs. Butter</u>
Started operations May 1914	
8 mos. 1914	151,891
1915	315,179
1916	346,159
5 " 1917 to June 1st	138,827

The output is butter only. No possibility exists until after the installation of an efficient refrigeration plant to utilize the skim milk in cheese making. The creamery has installed at the present time only sufficient refrigeration machinery for the cooling of the moulding room and keeping the butter until shipment. Additional refrigeration machinery is now in prospect. Another grave drawback has been the refusal of the railroad company to supply refrigerated cars until shipments reach Mojave en route for Los Angeles. Shipments over this line average 15,000 to 18,000 lbs. per month and would seem to justify better service if the product would escape a bad reputation for its poor condition upon arrival in southern markets. It is this fact that has made the Nevada markets of Goldfield, Tonopah and the local channels of disposal more sought than the southern possibilities. Shipments from Bishop travel the 100 miles of torrid desert during the summer months, wind through the the rock strewn and baking mountain passes, thro the Mojave Desert to oftimes be held

over at the main line junction until the butter leaks.

The output from the creamery is 1 and 2 pound packages and cubes which average 72 lbs. net each. About half goes to Los Angeles. Only pasturized butter is produced.

Wagons collect the cream from the ranches daily, returning the test and cream credit checks for the previous day. The average price for 1916 was 28.7¢ per lb. to the producer. Patrons receive 2¢ per lb above the Los Angeles market quotations. The operative cost at the Bishop creamery is .049¢ per pound of butter produced. There are about 100 stockholders in the creamery, all of them dairymen and this number is steadily bound to increase with the ascending interest and activity in dairying throughout the County. With added production it is contemplated that grading cream will shortly become a factor of this plant to improve the quality of the butter.

The output from the creamery in Round Valley, which is privately owned, is about 30 lbs of butter per day. All marketed locally.

There are several dairies in the vicinity of Bishop which supply that town with milk and cream for domestic consumption.

L I G H T &
P O W E R

H. O. Wangelin, Superintendent Southern
Sierras Light & Power Co., Bishop
Authorities: Fred M. Hess, Manager, Interstate Tele-
phone and Telegraph Co., Bishop

L I G H T A N D P O W E R

On Bishop Creek are generating plants of the Nevada-California Power Company and the Southern Sierras Light & Power Company, allied corporations. The plants of the Nevada-California Power Company supply only towns in Nevada, Goldfield, Tonopah, etc., - but the plants of the Southern Sierras Power Company together with those of other allied companies supply territory from Wonder, Nevada, to the Mexican line. This is the longest transmission line in the world.

The rates which apply in Inyo County are the same as those charged by the same company for industrial and irrigation pumping service throughout territory in San Bernardino, Riverside and Imperial Counties, which they serve to a large extent. Rates for pumping 24 hours continuous service graduate from \$50. per H. P. year for 12 months, to \$27. per H. P. year for 4 months. For industrial purposes the rates vary from 3¢ to 1¢ per K.W. according to the grade of service supplied and consumption. Three years ago there was practically no load for the mines or industries in this County. There is now an industrial and mining load, exclusive of the lighting, which for some of the industries carries as high as 2,500 H. P. These industries have been built up during the past three years greatly through the possibility of electric power. Many of them were formerly operated by other forms of power.

The payroll of the Southern Sierras Power Company is \$60,000. for regular employees not including day laborers and contract help. This organization is among the pioneers in certain lines of electrical development and engineering skill. When the tower line was constructed to San Bernardino, a distance of 238 miles, it was scoffed at by many engineers as being impracticable. This was the longest tower line in the world until the construction by the Pacific Light & Power Company

LIGHT & POWER - 2

of the Big Creek line, which is 2 miles longer. The Southern Sierras Power Company was one of the first to install and develop the outdoor type of substation and it has proved so successful in all kinds of weather and climatic conditions that same are being used for all transmission installations, both for sub-stations and power house purposes. The construction of the plants, towers and pipe lines of this system have many unique and original features, most of these are the result of overcoming difficulties which had to be surmounted and were different from ordinary power plant development. The lines of this company pass through bad sleet, snow and landslide zones and during the terrific storms the operating portion of the Company is taxed to the utmost in keeping the lines open.

TELEPHONE AND TELEGRAPH

Telephone service is supplied by the Interstate Telegraph & Telephone Company to all towns in the tributary to Owens Valley. The progressiveness of a community may be gauged largely by the number of telephones which are installed, and the farming districts in Inyo County testify to community progress by the number of phones.

Telegraph service is also furnished by this corporation as well as the Western Union Telegraph, which is represented in all the more important towns of the Valley section.

INDUSTRIESL I V E S T O C K

Inyo County is primarily a cattle and mining country and all the money of early days was made in one or the other of these industries. And the larger part of it still is.

It is naturally adapted to the production of livestock, possessing good range, water, meadows, protected valleys for winter pasture and a climate seemingly exceptionally adapted to the hardy and healthy development of all stock. Epidemics have from time to time swept the herds but compared with other livestock districts of California, little disease is apparent. Glossy coats, splendid development and high dressing percentage mark the herds of cattle and bands of sheep seen throughout Inyo Co.

The one time friction between cattlemen and agriculturist is dying with the realization by the former that many acres which could not profitably be used as grazing or meadow land, may be made to produce large crops and rich returns. It is the dream of the men who have the county-wide interests of Inyo at heart, to see some spirit of cooperation and community interest spring up between these two factions. When this comes true and both sides realize that "all must work together to make a perfect whole", there is nothing to keep Inyo County from becoming one of the most productive, wealthiest and important counties in California.

So important is this subject of Livestock that any composite article on the subject would not be sufficiently clear. We have therefore taken the various branches in alphabetical order:

Chas. Summers, Bishop
Silas H. Reynolds, Darwin
Mrs. E. H. Edwards, Lone Pine
R. P. Strathearn, Independence } ranch
D. L. " " } 12 mi
 } north

Authorities:

V. E. Holehan, Bishop
A. J. Gallaher, Lone Pine
Harry Shaw, Bishop

As an industry Beef Cattle coupled with Mining is the most important production of Inyo County. In view of the immense requirements not only of the United States but the Allies, the beef cattle vie with munition supplies in importance and the production must be not only stimulated but materially increased to meet the enormous and growing demands. It is fool-hardy however, for the novice with small capital to enter the livestock game not only here but in any other section of California. The success of the cattleman depends very largely upon his natural, inherent ability to judge the maturity possibilities of young stock, negotiate for the purchase of the small man who is getting pinched in the high price of hay or inadequate grazing acreage, and last but by far the most needful requisite - the ability to meet physically, the strain of handling large herds day and often all night, during the spring and fall moving.

The life of the cowboy has been glorified in song and story but nothing has been said about the BOSS, whose motto is, "If you want things done right, do them YOURSELF". The cattleman who enjoys success is busy every moment. Supervising spring and fall round-up, negotiating for range and pasture, harvesting winter feed, riding and cutting out weak or sick animals during the severe winters and marketing his steers to the best advantage thro' the packing house buyers. He must also keep in touch and full knowledge of the outside demand and to anticipate the market needs of at least one if not two seasons ahead, or find himself with too many mature beeves in a year of short crops and market prices. The man who enters the game should have experience

BEEF CATTLE - 2

and the warning that a capital of at least \$10,000 with credit for half that amount at his command - will not be needed.

About 6,500 head of beef cattle are shipped from Inyo County yearly. Two-thirds of these are steers, one-third cows, worth respectively according to a 5 year market price \$80. and \$65. per head live weight. This would mean approximately half a million dollar industry for the County - \$140,855. for cows and \$346,720. for steers.

COST OF STOCK AND EQUIPMENT

Quotations given by nine cattlemen for stock, average about as follows:-

	Per Head	
Weanlings	\$31.00	
Heifers coming fresh	45.00	
Short 2's	42.50	
Long 2's or short 3's	51.60	
Aged cows	35.00	up
Unregistered purebred		
bulls	134.00	"
Registered		
bulls	175.00	"

Equipment consists of adequate pasture and assurance of summer range either in the National Forest or rented, although little of the latter is obtainable; sufficient number of cattle horses to work the stock; hay for winter feed and a boundless amount of energy to meet the demands of the business. No barns are provided for the herd during the winter. Weak or sick animals are housed during the storms.

BREEDS

The Hereford is the favorite with Durham or Shorthorn a close second. The former for the rugged mountain range seems to do better as a forager, mature quicker beef and has higher dressing percentage. They are more nervous and a trifle more difficult to handle than the Shorthorn and more energetic, making better breeding stock on the range.

BEEF CATTLE - 3

One herd of purebred Polled Angus is found in the County. The young bulls are sold for breeding purposes at \$100. per head; heifers not for sale.

DISEASES, PESTS AND HINDRANCES

Blackleg and anthrax have had their years of heavy toll, but with the exception of a few comparatively small bands, no vaccination is practiced. The serum or pill treatment administered for anthrax and blackleg, are the methods employed. Anthrax is most feared during the warm weather and blackleg attacks the yearlings and two year olds in good condition.

Poisonous weeds in many of the mountain ranges have been the cause for extended loss and it is contemplated that the Cattle Association of Inyo County will take steps to eradicate this curse. Poison wild parsley on the summer range is the chief pest and most dangerous in the milky stage just before the plant begins to dry up in June or the first part of July. Loco or rattlesweed is another pest found mostly in the valley pastures. Rabid coyotes occasionally cause loss. Throughout the mountain districts stringent watch for these marauders. is maintained.

PRODUCTION AND MARKETING

It is difficult at any time to buy young heifers especially from lines of high dressing percentage stock. Little or no baby beef is sold except in seasons of extreme crop or hay shortage. Steers go to market usually as long 2's or 3 year olds, weighing at that age from 1150 to 1280 lbs. The average selling price prior and including 1917, averages 6.95¢ per lb. gross weight. All cutting out is generally done on the range and the price is f.o.b. loading pens railroad point. It is the custom of the buyer to select such steers or cows which meet his demand, on the summer range and this band for market is driven out first, leaving the cows with calves, yearlings and short 2's to follow to the winter grazing grounds. In this manner the band is moved more slowly so that loss in weight from the drive is minimized by the fresh, strong pasture found along the way. Cows

BEEF CATTLE - 4

bring 1¢ less per lb. than steers, gross weight.

The principal market is Los Angeles and representatives from Cudahy & Co., Newmarket Co., Hauser Packing Co., Woodward & Bennett and occasionally the Western Meat Company, snap up the beef supply of this County. All shipments are carload lots.

It has been closely estimated that purebred steers will average from 1½¢ to 2¢ better in price per lb. than the grade but the raising of purebred stock necessitates large and expensive fencing and greater care and consequent attendant expense of management and handling.

Fat steers off the range will dress about 62% and old cows about 50%.

FEEDS

Nearly every cattleman in the County raises his own alfalfa for winter feeding and often pastures his stock on the stubble fields after the last cutting, or if two cuttings are made allows the third crop to attain a good growth and then utilizes it as pasture. This follows the fall round-up when the herds are brot back from summer range. The Inyo National Forest Reserve issues grazing permits yearly. The applicant must have at least 25 head of cattle and is allowed a 10% increase annually in the herd. It is the custom of each owner to apply for the same range each season and during the past few years many ranges in the Forest Reserve have been fenced. Any voilation of the rules and regulations governing the grazing of cattle, horses or sheep on these Forest Reserves acts as a revocation of the permit, which is not issued for a term of years but must be applied for from year to year. The price for grazing cattle for the season of 1917 has been about 45¢ per head in the National Forests. The herd begins moving for the ranges about the 20th of June and are taken out the 15th of October. About 4 to 6 acres per head is the appropriation for Forest Reserve range.

Owens Valley, Monachie, Long and Round

BEEF CATTLE - 5

Valleys are the principal winter pastures. Much of this grazing land is rank meadow, lush in salt grass and it is necessary to supply hay for about three months of the winter, from December to March. Little pen fattening is done although this may become more popular if the promised success of sugar beets in this country is fulfilled, for beet tops make succulent feed. When finishing steers in pens about 40 lbs. for 3 year olds and 30 lbs. for long 2's per head of hay is fed daily. Very small amount of water is allowed.

Inyo County is particularly lucky in the purity and plenty of the water throughout all livestock districts and no animal need die for lack of it unless lost. Even on the desert ranges, springs are found and piped to troughs for the stock.

In the management of the herd of purebred Polled Angus above referred to and those of several cattlemen who are experimenting with the raising of purebred Shorthorn and Hereford, the calves are fed alfalfa hay, dried timothy or clover until over three months old, when they are turned out on green pasture. Many of the cows, especially the Shorthorn and Polled Angus, have more milk than the calf can take. This is milked out on the ground or fed to hogs. Fat calves are vaccinated twice a year for blackleg until long 2's and then once for anthrax.

Meadow land for winter pasture costs about \$2.50 per head per season and summer pasture will average about the same. In addition at least \$5. worth of hay is fed per year. This would make a total feeding cost of a 2 year old steer at least \$20., which of course does not include taxes, depreciation on equipment, horses, interest on investment, handling, etc.

LABOR

There has been a scarcity of labor throughout the County in nearly every agricultural line and where the cattleman formerly paid \$40. per month and found, cowboys demand \$50. per month and found, now. About 50% more labor is required in the spring and fall during drives than at other seasons. Most of the cowboys come from the Southwest or off the Nevada ranges.

PROFITS

Profits in any livestock game depend so largely upon the business acumen of the individual and the lucky coincidence of being in line to buy small bunches of cattle at dispersal or private sale, that any figure given would be subject to severe criticism. Suffice to say in years of demand and no disease in his herds, the cattleman makes money but the other side of the ledger is equally to be considered - the years of high hay costs, short range and disease running rampart.

VALUE OF LAND

Land suitable for cattle range in Inyo County in the mountains and along the mesa lands close to the Sierras, is worth from \$25. to \$50. per acre with water right. The City of Los Angeles rents its extensive meadows along the Owens River, but the water right is not intended to cover long term leases and may be revoked at any time. This makes uncertain conditions that few care to take chances with, except from year to year. Pasture land in the valley sections suitable for winter grazing runs about half meadow and half alfalfa land may be obtained from \$75. to \$150. per acre carrying water right.

STOCK ASSOCIATION

The interests of the cattle men are protected by the Inyo County Livestock Association which employ range riders to return strayed cattle, prevent rustling and report accidents such as cloudbursts, landslides in the mountain ranges, breaks to fences, etc. All the brands and earmarks of the members are registered and printed in neat book form. Such organizations will materially aid in the enforcement of the new law governing the trading, selling and disposal of cattle by those not legally equipped with written evidence of ownership and cannot but materially aid in bringing up the already high standard of the beef shipped from Inyo Co. It shows the progressive spirit and effort to cooperate among the big men of the County, for the good of the industry.

H O G S

J.L.Gish, Laws

Russell Spainhower, Foreman Acqueduct
Ranch, Lone Pine

Authorities: G.P. Doyle, M.D., Bishop

J.K. Thomas, Bishop, ranch $1\frac{1}{2}$ mi. s.w.C.D. Thompson, " " $3\frac{1}{2}$ " " "EXTENT AND SECTIONS

Although nearly every ranch has its quota of hogs, it is with the growth of the dairy industry that hog raising is also coming into commercial importance in the County. With climatic and feed conditions fully in favor of this, there is no reason why the production will not steadily increase in importance and value, for the majority of the hog raisers are starting with good blood lines.

COST OF STOCK AND EQUIPMENT

Many purebred boars, most of them registered are found and the sows are mostly good grades. Stock in the Valley when obtainable is valued about as follows:

<u>Description</u>	<u>Grades</u>	<u>Unregistered</u>	<u>Pure-breds</u>
		(Registered about \$5. more)	
Weanlings	\$5. up		\$15.
3 to 4 mos shoats	10.		20.
Brood sows	\$20. to \$25.		50.
3 to 4 mos. boar	50. up		50. up
(Registered)			
Grade boar	20. to \$25.		
Aged registered boar			
proven line			200. "

Not much good breeding stock is obtainable in the Valley at the present time for the hog raisers are fattening the poor specimens and keeping the pick for breeding purposes.

More old fashioned pig stys are found than modern breeding and farrowing pens, throughout this section of the State. Some novel ideas, many of them practical have been observed. One hog raiser drives posts of 4 x 4 inch lumber, about ten feet apart in four parallel rows the measurements of which he desires to make his hay stock. On top of these are laid scantling and on top piled the 40 or 50 tons of winter hay. 80

This of course works down on the sides and constitutes a warm and cozy hog house for the herd during the winter months. Needless to say no hay feeding is necessary. The same plan has been employed for young dairy calves with the scantlings crossed at a higher mark. Farrowing pens for the purebred stock are constructed at high cost here unless old lumber is used, on account of the transportation rates. These generally are enclosed on three sides and open on the east. One raiser constructs for about \$10. not including labor a farrowing pen 7 x 14 ft., half of which is roofed.

One safeguard against disease and unhealthy condition is the absence of hog wallows. Clear, running drinking water in troughs so protected that the hogs may not wallow in them, is advocated.

Some of the pens are long sheds about 80 x 10 ft. partitioned into 10 x 10 ft. compartments and roofed with straw or brush, at minimum cost.

BREEDS

The Berkshire, Duroc Jersey and Poland China seem best suited to this altitude and climate. The Chester White sunburns easily here and also the Durocs, especially the purebreds. The majority of hog raisers devoting a maximum amount of their time to the industry have purebred and often registered sires and grade sows, altho some few purebred brood sows have been brot into the Valley and the offspring used for breeding purposes.

FEEDS

The creamery at Bishop sells skim and buttermilk to the patrons of the creamery at reduced market price and a large portion of this goes to the hog men. Practically all finishing is done on corn and chopped alfalfa. Young shoats are often fed ground alfalfa where the ranch is equipped with a grinder and sometimes corn is treated in the same manner. While the purebred will generally bring a better price than the grade hog, it takes more and better feed to fatten grades, for the purebred is fed to develop

bone and frame and they do not mature as quickly as the grade stock. At the present price of grain it is estimated that from 8 to 11¢ per lb. is the poundage cost of pork production from time of weaning to marketing at 9 or 10 months of age, for the purebred. About 3½ or 4½ lbs. of grain for each pound in weight. The purebred at time of marketing will dress about 20% better than the grade, or about 80%.

The estimated cost of producing grade pork here is about 1¢ less per lb. than for the purebred and the hogs go to market from 9 to 14 months of age, weighing about 180 to 230 lbs.

It is the custom of the hog raiser who has an orchard to let the hogs have the run of it to clean up the fruit after picking season. Many do not cultivate their orchard and have it subdivided with shelters built across one corner while the sows and suckling pigs are allowed the pasture this affords. The marketable pork is turned into the stubble fields after the grain harvest and this usually starts the finishing feed of a herd which will be marketed in three weeks or a month from that time. Many hog raisers who have quick maturing hogs for which they receive high prices, do not advocate too much alfalfa. One of these grinds wheat and barley into meal, cuts dry alfalfa into pieces not over 1/4th inch long, mixes in equal parts and dampens with water. This cannot be used in self-feeder as it sticks to the sides and will not work through. The hogs are given all they will eat. Few self-feeders are used in the valley. Young shoats are fed about 5 lbs. of buttermilk per day with dry alfalfa and allowed to run on stubble field.

The Yellow Globe stock beet seems to grow more satisfactorily here than the mangel. The leaves spread over the ground and during the winter they may be left until wanted for feed, while the mangel becomes frost nipped and the foliage dies leaving no protection for the ground around the beet which freezes and is difficult to dig out.

PRODUCTION AND MARKETING

The market weight all ages and breeds may

be said to run about 200 lbs. here for hogs 11 mos. old. The litters throughout the County average 7.37 pigs, all breeds. Duroc Jersey seem to run largest, for individual breeds.

Many of the large raisers buy the hogs of their neighbors which are ready for market and ship at their own expense in carload lots to Los Angeles. For the past four years this price has averaged 9 $\frac{3}{4}$ ¢ per lb. gross weight here to the hog raiser and about 12 to 14 $\frac{3}{4}$ ¢ f.o.b. Los Angeles. Cost of transportation in carload lots of about 90 head per car averages 1¢ per lb. from Laws. Hog raising is on the increase in the vicinity of Bishop, where also the dairy industry is steadily gaining importance and these two are so closely allied, that with the success of one comes the automatic adjustment of the other.

PESTS, HINDRANCES AND DISEASES

No Hog cholera has caused loss here and no one vaccinates. During the hot weather dipping or spraying with crude oil emulsion at least every 60 days for lice, is necessary. Many raisers put a large number of hogs into a small pen until they are packed closely together. A large swab on a broom handle is used to apply a liberal smear to the back of each hog and they are left at least two hours to allow the crude oil to spread and be rubbed in thoroughly by their contact together. A few tick are sometimes encountered especially if the hogs have ranged in uncultivated areas. Sunburn is one of the most frequent causes of loss in late spring and summer litters. Unless the little pigs are confined so that they cannot run out in the intense heat, sunburn causes their ears and tails to cook and fall off, and if the pig does not die, he will not mature and at 12 or 15 months of age will remain stunted. The majority of the hog men kill the badly burned suckling.

PROFITS

Difficult to give fair estimation of profit in any section and especially here, where so little accurate record of feeding costs or even methods are obtainable. Much depends on luck of raiser in acquiring good stock at reasonable figures at the start and the amount of feed which he himself raises, etc. It is said that pigs are about 50%

Inyo Co.

LIVESTOCK
HOGS - 5

profit when a side line to a dairy but this is questionable with the present price of grain and labor shortage.

H O R S E S

Wm. B. Rowan, Bishop ranch $3\frac{1}{2}$ mi. n.w.
Authorities: Robt. P. Strathearn, Independence, ranch
13 mi. n.
D.L. Strathearn, see above

EXTENT AND SECTIONS

Inyo County has always been noted for the excellence and staying qualities of its horses. Both draft and saddle animals have made a fine reputation for the county. With increasing popularity of the motor truck in cities, the market for draft stock in this section, as well as in every heavy-horse breeding district throughout the State, has been on the decline altho breeders here claim market for their entire output. With the many acres of orchard planted within the past five years in the Owens Valley, coming into bearing the demand for the short, blocky horse especially adapted to orchard work is rapidly increasing. Saddle stock as long as the cattle industry remains the most important agricultural industry, will always be in demand and the horses here show sure footedness and endurance when shipped outside the County. Raised in rough country and used to distinct variations of altitude, water and temperature, they are fit for long and valuable service in any section to which they may be shipped.

It is now under advisement by the United States Department of Agriculture to establish in Owens Valley a training and breeding farm for horses intended for use by the Army and the Allies.

COST OF STOCK

Little trading is done in weanlings, either draft or saddle animals. Range mares bring from \$50. up and 2 or 3 year old saddle horses \$65. to \$90. per head unbroke. The well developed gelding with good walk or rack, is especially desirably for the cattle man and the supply never equals the demand for this type of horse. Draft stock is usually broke to work on the ranch and sold in carload lots to Los Angeles or San Francisco markets, when three or four year olds. At this time the good grade

draft animal will top 15½ hands and weigh about 1,600 lbs. Weanling draft colts bring from \$50. to \$75. per head when obtainable.

BREEDS

Percheron and Clydesdale purebred, registered stallions are mostly used with grade mares at service cost of \$15. Few saddle stallions of any particular breeding are found, but those with notable get are primarily Hambletonian or Kentucky Gaited Saddlers. Often with a large mixture of mustang or wild range horse. Good results have been obtained by crossing Percheron grade mares with purebred Clydesdale stallions, and visa versa. Several imported Kentucky and Missouri jacks are found in the County and demand for mules and mule colts is increasing with the activity in the mining districts as well as the constant outside demand of the Government for animals answering specifications. Stud fee for jacks and saddle stallions is \$20.

FEED AND MANAGEMENT

None of the draft stock is ranged but turned out in valley meadows and fed hay for about 4 months during the winter season. Draft stock when worked is generally given grain.

The mares are bred at a time to insure them dropping their foals during the spring or summer and the colt spared the severe winter when they are little. Draft and saddle weanlings are fed grain and hay for about 3 months, then taken with the 2 year olds to the summer ranges for 60 or 75 days. The very small colts and the mares are pastured in the valleys.

National Forest Reserve is often used for summer pasture and horses are ranged here for about 50¢ per head per month for three months of the year. The City of Los Angeles rents thousands of acres of meadow pasture at prices ranging from 25¢ per acre on long term lease, to \$10. per acre per annum.

It is estimated that the cost of feeding horses, when the farmer raises his own hay and grain, runs about \$25. for hay (at the present price) and \$12.50 for grain per head per annum. No horse raiser in the county keeps accurate ac-

count of the amount or selling price of feed for his stock and these figures are largely speculative.

The horses are housed during the more severe snow storms but are pastured the greater part of the year.

DISEASES, PESTS AND HINDRANCES

Lung fever among range stock occasions loss. This is often produced by overheating "soft" horses in the early spring rodeos and the animal allowed to drink too much melted snow water. The purity and abundance of running water is largely in favor of the eradication and control of glanders throughout this district. Few cases of this dread disease have been reported in the County.

Anthrax has occasioned loss especially in infected fields. Many stockmen have found that the following formula materially aids in the prevention of anthrax, not only among cattle but horses:

1 pail salt	} Mix well together } Spread in troughs } in field and range.
1/2 " sulphur	
8 tablespoons black antimony	

The stock will readily consume. Unlimited quantities will not injure the stock.

A disease which has not yet been diagnosed is prevalent among the saddle stock. It is thot to be brot on by overwork and insufficient care, chilling after overheating or indifferent feed. This affliction indicates its presence in sores resembling kidney sores which extend however, the entire length of the animal's back; in general breaking down and extreme tenderness and pain along the spine from the withers to the base of the tail. The horse refuses to eat, quickly weakens and dies in about two weeks. Vetrinary skill and experience seem of little avail.

Decided change from grazing on damp meadow land some of which is covered with water

to the alkali dust and sharp rocks of the ranges tends to bake and split the hoofs of the saddle stock. If however, the young animal is kept on range or very dry pasture its hoofs are firm and without cracks and desirable from every standpoint.

On the whole the horses of Inyo County are particularly free from disease, hardy and valuable and desirable animals to own.

S H E E P &
G O A T S

Silas H. Reynolds, Darwin
 J.C. Stewart, Big Pine, ranch 2 mi.s.
 J. Barlow, Bishop, " 21 " n.
 Authorities: C.C. Neel, Independence, " 21 " "
 Charles Summers, Bishop

EXTENT AND IMPORTANCE

Sheep raising and wool production constitute one of the strong livestock items of Inyo County although no one section may be said to be the home of the sheep bands, which are migratory. Owners hire herders who live with the bands, driving them over the country to range or pasture vacated by the cattle and horse bands and into the mountain ranges where insufficient pasture for anything but sheep or goats exists. There are according to the records of the Tax Collector's office of Inyo County about 20,000 head of sheep worth \$79,272. and 900 head of goats assessed for \$2. per head in 1917. The herders are mostly French and Spanish Basque.

BREEDS AND COST OF STOCK

Hampshire purebred bucks are crossed to the range or "Merino" ewes in most of the large flocks, altho some sheep men favor the Rambouillet. Some years ago several experiments with Lincoln, Cotswold and Persian Fat Tail sires were made but these did not prove good breeds for existant conditions here. Recently effort has been made to breed up ewes and one of the largest bands ranged in the County is about 3/4th purebred. Registered bjcks may be purchased in the valley for \$80. up and unregistered purebred sires are worth from \$30. up. Two or three bucks are run with every 100 ewes. Spring lambs except from extremely good lines are not often sold and the price is live weight basis. Young ewes bring about \$10.50 per head at the present time and old ewes from \$7.50 up, according to age and condition. It is not of much guidance to quote prices per head as the majority of the sheepmen who are materially increasing their bands go to Nevada and buy up whole herds after lambing time, sometimes of 1,000 or over and in the spring as soon as the snow in the mountains permits of them being driven over the Westgard or some of thro' trails from the deserts to the east of Owens Valley. They are pastured along the way and reach Owens Valley or one of the protected mountain valleys where winter

pasture is obtainable, in time for the fall shearing.

Grazing permits for sheep are obtainable in the National Forest Reserves but the acreage of these is distinctly marked and the passage to and from these allotments must be made as specified by the Rangers' office so that the sheep move in last after the cattle and cannot be brot out until after them. Cattle will not range after sheep. They are taken into the Forest Reserves about the last of June and the herder starts the band for the winter pasture about the middle of October. Price of range averages 14¢ per head per month and permits are revocable from year to year. Stubble fields either alfalfa or corn stalks, rent from \$2.50 to \$8. per acre for winter pasture and hay is fed about 2½ or 3 months during the most severe winter months. No shelter is provided except for sick or weak ewes and their lambs. Range and brush land in normal year will carry about 25 head of sheep per acre at a maximum and stubble fields and meadow pasture if well taken care of will support 30 to 40 head per acre.

PRODUCTION AND MARKETING

The spring lambs are the heavy shipment in carload lots to Los Angeles. These like the cattle are cut out on the range and driven to loading yards in advance of the balance of the flock. Most of these lambs are born in Feb. and by the following September or October weigh from 36 to 40 lbs. The average selling price is live weight loading pen and runs about \$7.50 to \$10. per head or an average 5 year price prior to 1917, of about \$4.50 for spring lambs and \$5. for mutton sheep. The ewes usually are kept from 5 to 6 years for breeding and bring during the past two seasons about \$10. per head or an advance of 100% over previous years. When the flock is small and the farmer pastures on meadow and stubble land throughout the year the ewes are of longer term of productivity; the shrinkage of fleece about 40% less and the lambs bring from 75¢ to \$1.50 per head more, as a result of pen feeding and individual care. The lambs when weaned are taken from their mothers and put on alfalfa hay in corral, under this method of handling.

SHEEP & GOATS - 3WOOL

The majority of the wool sheared here is high in shrinkage as a result of the long and dusty drives and the roughness of the sheep range generally throughout this section of the State. The sheep are sheared but once a year, generally in the middle of May and the fleece averages 10.8 lbs. per animal with a selling price based on the past four years of 23½¢ per lb. Shearers travel through the country under the direction of a boss and shear for about 12¢ per head. The price made depends very largely upon the size of the band and the price of wool that season.

The assessed number of fleece raised in Inyo County for 1916 was 17,847 but this is acknowledged to be very low in number. Small decrease for 1917.

PESTS, HINDRANCES AND DISEASES

About seven years ago scab ravaged the flocks throughout the County but has given no cause for alarm since. Ticks are bothersome and dipping is practiced once a year in the majority of the flocks, but twice by the herdsman who keeps his sheep in the valley throughout the entire year. Poisonous weeds occasion loss on some of the mountain ranges in early summer. These are chiefly parsley, parsnip and loco weed. Coyotes are a menace that must constantly be guarded against in certain sections of the County, especially in isolated desert valleys like the Fish Lake, Deep Spring and Round Valleys.

Some loss is experienced from pneumonia especially among the lambs dropped in the early winter. On the whole sheep are very healthy in Inyo Co.

PROFITS

Several sheep raisers were frank in asserting that 50% profit is to be made on spring lambs in a normal year.

SHEEP & GOATS - 4GOATSEXTENT AND SECTIONS

Several bands of goats have been brot into the County and mostly maintained on range in the White Mountains or in the mountains around Death Valley and Rhyolite, Nevada. These were mostly Spanish goats bred up to purebred Angora by registered sires. No young kids were sold but kept for breeding purposes. Small bands of Angoras may be encountered throughout the ranches in the Owens Valley but the large herds, some of them numbering 1,400 in 1916, were ranged in the extreme eastern part of the County. They are more difficult to handle than sheep but will fatten on desert brush where sheep would grow poor.

COST OF STOCK - MOHAIR

Purebred bucks are worth from \$40. to \$90. some of them registered; ewes all scrub stock, bring from \$8.50 to \$10. per head. Much of the meat supply for the mines in the Funeral and Panamint Mts. is goat meat which commands an average price of 15¢ per lb., dressed weight and is said to be delicious eating when properly cooked. The goats are dipped every other year for scab and seem to be particularly disease resistant. Sheared once yearly about 4 lbs. of mohair which for the past two years averaged 68¢ per lb.

A herder for sheep or goats is paid from \$45. to \$60. per month and his grub stake. Inasmuch as goats are maintained at less cost than sheep and far less loss from disease, this is an industry which should grow in this section where an abundance of mediocre pasture is always to be had.

M I N I N G

John H. Thorndike, Superintendent
Custer Mine, Darwin

Silas H. Reynolds, "

Authorities:-W.W.Watterson, Bishop

A.A.Ross, Darwin

J. A. Summers, Reward Mine, Manzanar

EXTENT AND IMPORTANCE

Mining, not only in the past but for promise of the future should naturally come second to no industry in Inyo County. The great variety of minerals found in paying quantities and the high grade of many of the ores taken from the prospects and largely operated properties throughout nearly every section of the County as well as the valuable soda and salt deposits of the Owens Lake and Saline Valley, make Inyo County especially noteworthy for the wealth of the minerals produced and their great diversity.

We have not endeavored to give detailed or technical report on this extensive industry for the State Mining Bureau issues minute and elaborate reports on mineral interests for every section of the State. We have tried to give the interested inquirer some idea of the present scale of operations, capacity and equipment of the most important of the mining properties now being operated in Inyo County.

Inasmuch as the great diversity of production would be confusing if reported as a whole, we will take the minerals in alphabetical sequence:

Authorities: F.W.Corkill, Supt., Pacific Borax
Works, Death Valley Junction
C.R.Dudley, Supt., Pacific Borax
Works, Oakland
W.P.Yaney, Mining Engineer, Bishop

EXTENT AND IMPORTANCE

Colemanite from which at least one-half the borax and boric acid consumed in the U. S. is made is mined extensively in Death Valley in the vicinity of Furnace Creek Canyon. This lies about 20 miles north of Death Valley Junction and is the terminus of the Death Valley Railway. About 2,500 tons of ore is calcined monthly in the roasters which are situated at Death Valley Junction. The mining for borax conducted in this section consists partly of quarry work and partly underground. The higher grade material is shipped direct to the refinery while the lower grade is concentrated by roasting before shipment. Air compressor, power drills and gasoline hoists are used for the mining while revolving cylinders and gasoline engines are employed for concentrating the minerals. The product is used largely by the eastern industrial plants and for household purposes generally.

About 50 men are employed at the refinery and 150 at the mine. Drinking water for the mines is hauled about 60 miles from springs in the mountains and for machinery uses at the works is taken from a deep well at the Junction.

Owing to the extreme hardship and inaccessibility of Death Valley the shipments of borax which came out of this district for the first few years behind the twenty-mules, made the products of this section famous throughout the civilized world.

REWARD MINEMINING - 3

Authorities: See previous page.

Some gold has been developed in the vicinity south of Darwin and in small workings throughout the Panamint, Funeral and White Mts. Of these the largest is the Reward Mine, situated about 10 miles east of Manzanar on the lower slopes of the White Mts. Here a tramway connects the entrance of the main tunnel 800 ft. higher up the mountain with the 20 stamp mill near the base of the mountain, where also is situated the Company store and about 20 cottages and bunk houses for the miners. This property it is reported has recently come under the control of British Capital who are opening up new stopes constantly. The ore is crushed and treated with the oil flotation process and shipped out sacked in the form of concentrates, weighing about 100 lbs. per sack. The ore runs about \$30. to \$40. per ton it is maintained. About 35 men are employed. Water is supplied by pumping from the floor of the valley, a lift of about 250 ft. The drying up of one well was the cause of closing down for some few weeks until successful boring located another apparently inexhaustible flow of 100 gals. per minute. Shipments are made from Manzanar on the S. P., about 4½ miles to the west.

CASA DIABLO MINE

The Casa Diablo Mine is situated about 21 miles n.w. of Bishop and at the present time after many years of semi-activity, is working ore with amalgamation and cyanidation processes. About 20 men are employed. This mine is an old working for gold and has enjoyed many bursts of operation, most of which were short lived. Ore is crushed in a ten stamp mill and the product trucked for shipment to Laws. A small cyanide plant is in operation, also power plant. The water supply is Rock Creek and the water is piped in 3 inch casing across the Owens River Canyon and that of another neighboring creek.

BEVERIDGE MINE

This property lies north and east of Lone Pine on the summit of the White Mts. It is now working constantly with crew of about 10 men. Is an old property and there has been quite a considerable amount of high grade ore taken from it.

Authority: Frank Adams, Coso Hot Springs

EXTENT AND IMPORTANCE

The Coso Hot Springs have the natural advantages to become one of the most remarkable and beneficial health resorts in the State if the waters were confined to sanitary channels and adequate bath and dressing houses erected. The springs have been in litigation for a number of years and the uncertainty of obtaining a clear deed has dampened the ambitions of quite a few prospective purchasers who contemplated the erection of a first class hotel and bath house and the improvement of the roads leading in to the springs. The curative properties of the water are truly marvelous and rheumatic and blood disorders seem especially to benefit by use of the steam baths and the moderate taking of the waters internally. At least six kinds of water are found in a radius of half a mile, both boiling and cool. The mud baths are thot by many to be the finest in the State.

ROADS AND ACCOMODATIONS

Coso Hot Springs is reached by turning off the State Highway about 100 yds. below Cowan's Station and traveling southeast through the Coso Hills 14 miles over a sandy road. Oil and gasoline sufficient to complete the trip must be carried as Cowen's is the last station where they are procurable. It is customary to go out by the way of Little Lake road which forks toward the southwest about 2 miles out of Coso Hot Springs and joins the State Highway near Little Lake Station. By taking this road a steep and very sandy grade on the Cowen Station road is avoided.

Meals are procurable for 50¢ each and tents equipped with cooking stove, beds and bedding may be rented by the camper or accomodations furnished on an American plan basis. A small stock of provisions is also carried by the boarding house at the Springs.

OTHER SPRINGS

Just over the county line in Mono County lie the Casa Diablo Springs whose waters also possess great curative properties and which are supported and improved by Inyo County capital.

S A L T

Authority: W. S. Proctor, Superintendent Owens Valley Salt Company, Keeler

EXTENT AND IMPORTANCE

The shipping of refined salt from the Owens Valley Salt Company has leaped to large proportions as a vast commercial enterprise with possibilities of becoming immediately and rapidly valuable from a mineral standpoint and capable of satisfying the increasing demand. The raw product comes from the Saline Valley which lies about 21 miles over a range of mountains to the east of Owens Lake and is brought over the range by tramway to the mills near Keeler. This tramway has the highest lift of any similar construction in the world, raising the salt in buckets carrying 1,000 lbs. each, from the floor of Saline Valley at an elevation of about 1,500 ft. above sea level to the 9,800 ft. altitude where the tram line passes over the summit of the intervening range. This with the exception of one tram line in Germany this is also the longest carry, approximating 14 miles.

The salt is taken from the lake in the Saline Valley, which at some seasons of the year is flooded and the production of salt therefrom is due to the evaporation of the seepage from the mountains. This forms a large dry lake on the floor of the valley and a track extends about a mile into the lake from the end of the tram line where the cars transfer their load to the buckets for the carry over the mountains. Upon arrival at the plant the salt is run thro different grades and sacked for shipment after going through a drying process and super-crystallization. Cartons containing salt suitable for table use, crystalized rock salt in large pieces for use in ice cream manufacture and for tanning as well as powdered salt used in the pancake and other ready-to-use flours, are put out under the trade name of "Red Mountain Salt."

A spur track runs from the main line near Keeler, into the plant. The capacity of the tram is a haul of 200 tons in a day of 9 hours and that of the mills 20 tons per day of 10 hours. 97

SALT

About 18 men are employed on the tramway, 45 in Saline Valley and 15 at the plant near Keeler. The water supply for the workmen in the Saline Valley comes from springs in the mountains which is piped to the mess camp. That for the works at Keeler, from two artesian wells which furnish constant flow of palatable water. Electric power line is now being brought into Saline Valley.

Many silver-lead, zinc, copper and gold prospects have been discovered in Saline Valley, some of them promising rich returns if the ore were brot out. Operators of some of these claims will probably take advantage of the means afforded by the tramway, to convey their ore to the smelters and railroad. The Owens Valley Salt Company in many instances has been large purchaser of ore and conveyed it out over their tram line. This might well be utilized by the mines in the Saline Valley and the probabilities are, that in the near future many rich deposits will be worked in this manner.

Silas H. Reynolds, Darwin
John H. Thornäike, " (Supt. Custer
Authorities: Mine)
A. A. Ross, "
H.O. Wangelin, Manager Bishop Light &
Power, Bishop

EXTENT AND IMPORTANCE

The principal silver-lead mines are in the vicinity of Darwin and in the surrounding mountain ranges. Many prospects which have promised rich returns are so situated that sufficient capital to install machinery, build roads and commence operations and maintenance until such time as ore is taken out in sufficient quantities to put the property on a paying basis, has not been procurable or the investigating capitalists frightened by the inaccessibility and ruggedness of the country and the impossibility of securing water not only for the domestic purposes of the camp but for mine operation. The veins of silver-lead ore run very high grade in many of the localities and the stimulus of war order demands has done much to build up this part of Inyo County, to the degree of importance and activity which in the past made it one of the liveliest mining camps in the west.

Darwin is the principal center of the silver-lead mining industry and the supply depot and boarding place for many of the men working in the neighborhood.

The output is mostly shipped to Utah for refining. Motor trucks and 12 mule teams haul from the mines to Keeler where it is loaded on cars of the Mina-Keeler branch of the Southern Pacific R.R. Some of the principal mines which are now being operated in this district run southeast from Keeler as follows:

SANTA ROSA MINE

This mine is situated midway between Keeler and Darwin, about 9 miles off the County road. It is operated by the company (Darwin Development Company) and by leasers. Ships about 600 to 700 tons per month with a force of 65 or 75 men. Trucks and teams both used to convey produce to the railroad

INDUSTRIES
MINING - 3
SILVER-LEAD
2

TALC MINE

See under subject of "Talc;" page 5 INDUSTRIES

CHRISTMAS GIFT

This mine is one of the oldest silver lead workings in the vicinity and a one-time large producer. Has 3-drill compressor and employs 10 men at the present time.

LUCKY JIM MINE

This is the property ~~and under the supervision~~ of the Darwin Lead-Silver Mines and Development Corporation. A shaft sunk to 600 ft. has disclosed large bodies of ore, running all grades from extremely high to low. 65 men at present are taking out from 300 to 500 tons per month, all kinds of ore. The equipment consists of an 8 drill compressor, 100 H.P. Deisel engine and motor trucks and mule teams are used for hauling. This is one of the largest and at present, most important properties in operation in the vicinity of Darwin. In connection with this property the mill at the

LANE MINE

One of the properties of the Darwin Silver-Lead Mining and Development Company is also an old property. Has mill installed which takes care of the low grade ores from the Lucky Jim, Columbia, Promintory and other mines in the immediate neighborhood by the murax process, which is oil flotation and magnetic separation method. The output is shipped in the form of concentrates. This mill has a 25 ton capacity and additional 25 ton unit is now being installed. About 15 or 20 men are employed and water comes from springs in the Darwin Wash.

PROMINTORY MINE

Belongs to the same Company as the Lucky Jim and Lane with a probable capacity of 10 tons per day. Operations are down about 400 ft. where bodies of shipping ore are found.

Inyo Co.

INDUSTRIES

SILVER - MINING - 9
LEAD - 3

COLUMBIA MINE

Is equipped with 1 drill compressor and a capacity of about 20 tons of milling ore per day. Employs about 5 men and is operated by the same concern as the five mines above.

TOWSER MINE

See "ZINC" on page 6 "MINING".

ARGUS
ANGUS STERLING MINE

This property is situated about 8 miles southeast of Darwin and employs one truck to haul sacked product into Keeler. Capacity of about 5 tons per day and 7 men employed.

CUSTER MINE

Situated 1 mile east of Darwin this old and onetime large producer of high grade ore, is again being opened up with a crew of from 10 to 12 men. Has 3 drill compressor and 40 H.P. Diesel engine. The shaft is now down 450 ft. and the production increasing daily.

DEFIANCE AND INDEPENDENCE

MINES

These mines when in operation furnish a large tonnage of low grade ore and are not being developed at the present time. When doing business about 300 tons per month is the output.

The Independence is the largest body of lowgrade ore in the camp and trucks are now hauling from the mine. The water supply is limited due to a 30 year old pipeline which is past its usefulness but plenty of water could be developed and it is spring water direct from granite.

CERRO GORDO MINES CO.

Tributary to Keeler, which is the terminal of a 5-mile tramway connecting the workings of the Cerro Gordo Mines with spur

track of the Mina-Keeler Branch of the SP., are some of the oldest silver-lead mines in the State. The Cerro Gordo Mines were worked by the early Mexicans and it is known that the first settlers in Inyo County operated them for silver and lead ore. In the necessary development work ensuing, rich deposits of zinc were disclosed. It is conservatively estimated that this mine in the past has produced from twenty to thirty million dollars. In order to work the zinc deposits the silver-lead ore was also mined and the smelting done at the mine and also at Swansea and Keeler. Much of the value of the silver-lead ore was lost owing to the low heat and poor process and at present much of the slag from these smelters is being sent to smelters in Kansas. From this worked-over output the silver and lead is obtained by means of high-heat extracting smelters.

The mines lie along the top of the White Mts. east of Owens Lake about 8 miles north-east of Keeler. There are about 30 miles of openings and at present nearly 100 men employed. The output is greater than for many years past and is constantly being increased. Some months ago it touched the 40 ton per day mark for zinc, silver-lead ore, sulphides and carbonates. If the Lane Mill is a success, it is contemplated that a similar mill for the Cerro Gordo Mines will be installed in Keeler.

MONTEZUMA MINE

This is one of the oldest mines in the County but does not have a constant production or steady shipment. About 20 men employed. High-grade shipping ore produced. It is tributary to Big Pine and situated in the White Mts. on the east side of the Valley.

MINING - 10

S O D A

Authority: W. W. Watterson, Bishop and Keeler

EXTENT AND IMPORTANCE

The shipping of soda obtained from the waters of Lake Owens is fast becoming one of the most important mineral industries of the County and at the present time three plants are operating on the lake shores. The Inyo Development Co. and the Natural Soda Products Company have their refineries on the east side of the lake and the factory of the California Alkali Company is now going up on the west side of Owens Lake at Cartago.

The plant of the Natural Soda Products Company has a capacity of about 20,000 tons of bicarbonate per year. Most of this production is converted into soda ash and is used largely in glass manufacture. This is the only factory in the west making bicarbonate of soda which is used in baking powder and household sodas, but the majority of the tonnage from this plant however, is utilized in making glass of extremely high grade, and cleaning compounds. The plant employs about 60 men. Spur tracks from the Keeler terminal run through this plant and also that of the Inyo Development Company.

The Inyo Development Company's Soda Works manufacture soda ash only, by a solar evaporating process and this is used largely in glass making also. With a capacity of about 7,000 tons per year, this plant employs nearly 100 men throughout the entire 12 months.

Most of the employees of both these plants live in Keeler or in Company cottages situated near the plants.

The product of the Natural Soda Products Company is shipped out by rail to Los Angeles and San Francisco and thence by boat much of the output goes to the Orient to be utilized in the manufacture of the famous Cloisenne and other fine porcelains. This ash is as high grade product as that produced anywhere in the world. This company has equipment installed and patent

rights for their processes for borax and soda from the waters of Owens Lake.

The new factory which is now nearing completion on the west side of the Lake will have a capacity of about 20,000 tons per annum. Machinery is being put in place and it is the expectancy of the Company controlling the works to begin operations by early fall of 1917. All kinds of soda products will be manufactured including bicarbonate of soda and soda ash. From 60 to 65 men will be employed. This industry is vicing with borax in making the name of Inyo County and its mineral products world famous for the method of shipping finished products, bearing a trade name or brand direct from the refining and manufacturing plant situated in the very locality where the mineral is obtained, and this it has been the experience of manufacturers the world over, is one of the surest ways of popularizing a product from any district or county.

John H. Thorndike, Supt. Custer Mine,
Authorities: Darwin
H. O. Wangelin, Manager Bishop Light
& Power Co., Bishop

EXTENT AND IMPORTANCE

The finding of large deposits of talc and its refining at Keeler, is of noteworthy importance as one of the most valuable commercial assets of Inyo County. A seemingly inexhaustible supply of this mineral seems to exist throughout the White Mts. with strong showings in the Coso and Argus Ranges.

DARWIN TALC MINE

Near the vicinity of the Santa Rosa Mine and between Keeler and Darwin, talc is now being taken out in considerable quantities and hauled to the refinery at Keeler, where about 20 tons a day is the output of refined product.

Other promising prospects have been made in the Darwin District and strong indications of large talc streaks discovered, but at present these are not of sufficient promise to warrant the operation of a crew or the installation of machinery.

About 8 men are employed at the talc mine and 3 at Keeler. The product is ground and powdered and reaches markets all over the country. It is used in the manufacture of talcum powder, being particularly free from ^{gases} minerals. The purity of the product demands a high price which is f.o.b. markets, not factory, quotations. It is also very valuable in the manufacture of bonded and high grade papers, paints, soaps, polishing high grade rice, used as a filling in tanning leather, in the making of fireproof materials and roofing and in combination with asbestos for household goods and extended uses in the making of various electrical appliances are constantly being discovered and tested.

TUNGSTEN

Authority: L. E. Porter, Manager Standard Tungsten Company, Bishop
W. P. Yaney, Mining Engineer, Bishop

EXTENT AND IMPORTANCE

The principal findings of tungsten ore in Inyo County have been in the Sierras, altho some prospects and promising leads have been made in the White Mts. on the east side of Owens Valley, however, these latter have never been worked extensively. There are two mines in active operation in the County northwest of Bishop about 7 miles. These are the Tungsten Mines Company and the Standard Tungsten Company, while the plant of the Round Valley Tungsten Company is nearing completion and ore it is expected, will be shipped before the close of 1917. The output from these three tungsten mines will be in the neighborhood it is expected of \$500,000 to \$1,000,000. per year. Concentrates are shipped sacked from Laws, the nearest railroad point, to Atlantic Coast markets which since the many and ever increasing importance of the uses of this valuable mineral, have never been overstocked. The output of this particular section is used largely as an alloy for steel.

The ore from both the Standard Tungsten Company and the Tungsten Mines Company is worked by the group classification and concentration method. The capacity of the Standard Mine is about 100 tons per day with a crew of 40 men and of the Tungsten Mines Company nearly 250 tons with 80 men. Boarding houses and tent houses for men with families are provided at both camps and store and supply depot maintained. The water supply for these camps, as well as for that of any camp or settlement in the Sierras is of assured purity and quality for any purpose needful.

The mill of the Round Valley Tungsten Company now under construction will have capacity of about 100 tons per day and employ at least 25 men. Motor stage to any of these mines can be taken twice daily at Bishop and the trucks from the respective properties haul freight and equipment.

John H. Thorndike, Supt. Custer Mine,
Authorities: Darwin
H.O. Wangelin, Manager Bishop Light &
Power Company, Bishop

ZINCEXTENT AND IMPORTANCE

While many zinc and copper leads have been found throughout Inyo County and the presence of these minerals in large quantities is probably a sure thing, the Towser Mine situated in the Darwin Wash, a few miles northeast of Darwin, is the one from which zinc is being shipped at the present time. This mine is owned by recently bonded interests and is aggressively preparing to work about 15 men. Full arrangements to ship the zinc by auto trucks into Keeler have been made from whence the ore will go to middle western and eastern smelters. It may be the beginning of a large industry as what prospect work has been done shows large and rich deposits. See also "Cerro Gordo Mines" page 3

COPPEREXTENT AND IMPORTANCE

While the indisputable presence of copper in large quantities in Inyo County is recognized, it would require the building of railroads to reach the prospects. The proper financial backing to open up paying developments of copper ore is at present lacking. There are therefore no developed copper prospects being worked in Inyo County at the present time altho many indications are found in the Ubehebe Dist. which lies east of Saline Valley and throughout the White Mountains.

POULTRY

C.A. Anderson, Foreman Eaton Poultry Farm, Big Pine, ranch $3\frac{1}{2}$

Authorities: mi. south

Mrs. R.A. Wilder, Manzanar, ranch $1\frac{1}{2}$ mi. west

EXTENT AND SECTIONS

Inyo County has one of the largest if not the finest equipped poultry ranch in California. No expense has been spared on the Eaton Poultry Farm in the erection of buildings, runs and tracks for the transportation of feeds and materials. Immense flocks of White Leghorns are raised which constitute the commercial shipments from the County altho during the past season live fowl, either Rhode Island Reds or Buff Orpingtons were shipped to Los Angeles from other ranches in the Owens Valley. Nearly every ranch has enough poultry to supply the table and there are several small ranches in the vicinity of Bishop and Manzanar, which meet local and mining camp demands.

Poultry is practically free from disease in this high, dry climate and many of the hindrances which the poultryman has to combat in other sections are entirely absent.

COST OF STOCK

The mortality for young chicks runs about 15% and in the second year as young pullets not over 5 or 6%. This applies both to egg laying breeds and to the meat breeds. Price of stock runs about as follows:-

<u>White Leghorns</u>		<u>Meat Breeds</u>
Day old chicks	12 $\frac{1}{2}$ ¢ each	12¢ each
Young Pullets	Not sold	65¢ "
Laying Hens	\$9. per doz.	\$9. per doz.
Young cockrels)		
Good laying)		
Line, unreg'd)	\$3.50 to \$10. each	50¢ each
Registered breed-)		
ing cockrels	\$25. " 50. "	\$2.50 "

One of the remarkable things about the flocks in this section is that they lay practically the year through, especially the meat breeds. The vitality of poultry here runs ex-

ceptionally high, about 90%. Baby chicks when hatched in January on the ranches, are kept inside until about a week old.

EQUIPMENT AND HANDLING

The Baton Poultry Farm cannot well be quoted as the relative type or for cost of construction on poultry houses in the County. Here no expense is spared and the scale is so large as to be beyond the ken of the ordinary poultryman. It is liberal education in poultry matters to go thro this remarkable plant. Here is an incubator house representing an investment of \$10,000 with hatching capacity of 14,000 chicks every 22 days; a 500 ton grain and feed storage warehouse; double boarded colony houses 76 x 12 ft. with one acre each allowed for runs and constructed at cost of \$1. per hen and the houses accomodate 300 each; overhead hot water heating system; complete railway and train operating over the 40 acres of the plant; hundreds of acres of corn, wheat, barley and green feed with which to supply the flocks. All colony houses open to the east. Everything in labor saving devices and for comfort and health of the poultry is installed - a veritable Palace Hotel for the hen. She shows her appreciation by making the annual laying average 130 eggs per year and sometimes keeps up that record for three years. It is estimated that owing to the high costs of operation that in a two year lifetime of productivity the hen will net 50¢ per year over and above all expenses, or \$1. for her average term of service.

On the ranches few provide suitable chicken runs or laying houses and the old country pastime of hunting eggs, although very amusing, wastes many minutes daily. In this manner it is estimated 10% of the eggs are never found and this induces predatory animals to frequent the ranch.

It is claimed that the Rhode Island Reds and Black Monorcas will average 150 eggs per year and this statement is well substantiated by numberless raisers of these breeds.

From 12 to 20 hens are allowed to each cockrel.

BREEDS

Several large flocks of White Leghorns provide the commercial shipments both eggs and meat, to Los Angeles markets. Rhode Island Reds and Black Minorcas do especially well in the southern end of the valley. Buff Orpington, Barred and Plymouth Rocks and Buff Cochin are breeds that have their sponsors among poultry raisers here. The Rhode Island Red lays almost the year through. While producing a brown egg less desirable for city markets, it is more in demand in the valley towns and mining camps, than the white egg. For the table, they far exceed the White Leghorn and other egg laying breeds. Some small experimentation was carried on one year in caponizing Rhode Island Reds for fancy market in Los Angeles, but the shipments were too small to permit of profit under the then existing railroad tariff.

PRODUCTION AND MARKETING

Eggs have averaged 31½¢ per dozen throughout the past four years and broilers bring about 22½¢ per lb. in Los Angeles markets, live weight. Expressage on return crates paid by shipper. Inyo County and Nevada mining camps provide a good market for eggs and poultry. It is possible with the increase in feed prices, that the industry will remain at a standstill here for some time, until the grain market becomes normal and the demand for finished beef and hogs, less.

FEEDS

A good deal of sour and skim milk is fed to chickens. The principal feeds are corn, chopped alfalfa and middlings. In the large establishments commercial balanced rations are often used and such feeds as cottonseed meal, soy beans, milo maize, Kaffir corn, etc., while grit, beef scrap and fish meal are standard components of the balanced ration mixed on the ranch. No Kale or Keoling corn is raised and the green feed is chiefly alfalfa or barley in small quantities. Clear running water is so

plentiful that mention seems superfluous altho this is an important and healthy adjunct for any poultry ranch. No costs of feeding, even estimated, may be given with any degree of permanency with the present price of hay and grain.

DISEASES, PESTS AND HINDRANCES

Roup takes its seasonal toll but no chicken pox or tuberculosis has been found in the flocks in Inyo County. Some worms, white diarrhoea and mites are found, mostly in dirty and neglected yards. These are easily controlled by a little earnest effort. Toe picking where the runs are on heavy and ill drained ground has been very troublesome but this may be cured by penning the flock in dry runs where the soils are sandy and loose. While mites or lice have not been a menace, the average poultryman sprays the laying and colony houses about once every 3 months, and oftener in the warm summer weather.

Coyotes and wild animals occasion some loss, mostly in outlying districts near the mountains. On the whole the poultry are very healthy here and the meat breeds especially do well under Inyo County climatic conditions.

PROFITS

As a sole source of income, poultry in this section with the present price of feed, would not be profitable.

AMARGOSA DESERT

Silas H. Reynolds, Darwin,
Authorities: Charles Summers, Bishop
H. O. Wangelin, Supt., Southern
Sierras Power Co., Bishop

LOCATION AND TOPOGRAPHY

Only the southern end of the Amargosa Desert, comprising about 15,000 acres, lies in Inyo County. The larger part extends northward toward Rhyolite Nevada, and the larger portion of the desert lies in that state. None of this acreage is irrigable and is used only for occasional winter pasture for sheep and for cattle rarely. The Amargosa and Funeral Mts. separate it from Death Valley to the southwest.

SOILS

These are of granitic formation from washes to the floor of the valley through the canyons of the surrounding mountains. Seepage with following evaporation leaves dry lakes of silt at intervals along the floor of the valley. Impossible to farm here without water which is costly to reach by experimental boring.

TOWNS AND ROADS

Schwaub's sheep ranch is the only settlement and a road leads west to Furnace Creek Ranch in Death Valley, about 12 miles distant.

D A R W I N

A. A. Ross, Darwin
Authorities: Silas H. Reynolds, Darwin
John H. Thorndike, "

LOCATION AND TOPOGRAPHY

Leaving the eastern shore of Owens Lake and traveling southeast over the only road reaching through to Death Valley from Inyo County points, one climbs through successive lava beds, barren and forbidding table lands and lengthy washes, some 1118 ft. onto the plateau where is situated the town of Darwin. In the surrounding mountains are some of the richest lead-silver deposits in the State and the Coso Range to the southwest furnishes strong indication of valuable deposits of iron ore and some copper, while past indications have revealed small free gold deposits. The character of the country is barren, rocky and non-productive of agricultural wealth, with strongly cemented hardpan and rock close to the surface, over most of this area. This renders impossible the raising of even small quantities of produce for the local demand, even should the necessary water be available.

PRODUCTS

Silver, lead, copper, talc, small quantities of gold, copper and zinc are the chief commercial products. The lower bench lands are used for early winter pasture and about 2,500 head are ranged in this locality, beginning in the fall. Some are driven over the mountains to Keeler for shipment or into the Owens Valley and the National Forest Reserve for winter or spring pasture.

TRANSPORTATION AND ROADS

The County road from Keeler 24 miles northwest from Darwin, continues through to Skidoo, 55 miles to the southwest and thence to Death Valley and the various mines once active but now mostly shut down in the Panamint Range. Darwin is the fitting-out place for prospectors and travelers to Death Valley and way points as well as the many prospects in the mountains south

of town. Burros, supplies and full instructions, warning and guides are to be had by the traveler ambitious to cross the Panamint and Death Valleys or prospect through the Darwin Wash. No one should attempt these trips unless they carry at least 25 gals. of water for an automobile and two machines making the trip, and it is far safer to wire destination to send a car out in search if the travelers do not arrive on specified time.

An indifferent road, passable some months of the year, leads to Coso Springs from Darwin. The best road for motor cars however, is reverse left fork running south around Owens Lake about one mile south of Keeler and turn to east just beyond Cowen's Station on the State Highway. This is excellent going except for marshy spot near Olancho during spring months and times of extreme high water.

An auto truck operates daily except Sunday between Darwin and Keeler, carrying passengers, mail and freight. Several auto trucks of large capacity and 18 or 20 mule teams provide transportation for the machinery and supplies for the mines installing and elaborating their equipment.

TOWNS

D A R W I N

HISTORY AND DESCRIPTION

The mines in Darwin were first discovered in 1874. The Christmas Gift and Lucky Jim Mines were consolidated and called the New Coso Mining Company and a 100 ton smelter put up. The Defiance Mine erected a 60 ton smelter. Both mines had a large production but the camp was boomed by stock gambling and all the large surface bodies worked at the smelters and no regard payed to developing reserves. When the Bank of California which was heavily interested, suspended in 1875, the camp began to decline rapidly.

The camp was in its boom from 1875 to 1878. In 1877 the population of Darwin was about 5,000 but by 1879 the boom declined and the town had only

75 people. Fires, decay, removal of buildings, etc. left but a remnant of former glory. The camp was given over to chloriders and very little mining was done until 1912, when the Christmas Gift, Lucky Jim and Custer started up again. The camp enjoyed a brief period of prosperity and then came another drop in metals in 1914 which stopped all development and the camp was stagnant till 1915 when the Lucky Jim and other mines were taken over by the Darwin Lead-Silver Mines and Development Corporation. From its seven year slumber the impetus of war orders and demands is just beginning to stimulate Darwin and its vicinity to much of its old time prosperity and activity. Mines are taking on all available crews and the business life of the town is again reverting to a substantial and increasing degree. The population at the present time including the tributary mining camps, is about 300. Here is situated large general merchandise store, lodging house, eating place, 2 pool halls and last telegraph station between this point and Death Valley Junction and the Nevada towns of Rhyolite and Bullfrog. Grammar school and branch County library are maintained here, also a Miners' Union which has erected a spacious hall for its meetings and here dances and other social gatherings are held. Gasoline and oil are procurable at the general store in Darwin. The water supply is of limited character nor is the water always of non-alkaline taste during summer months. It is piped 9 miles from the Coso Hills on the south.

S K I D O O

This town is 55 miles northeast of Darwin and has been a large shipper of gold although at the present time most of the mines in the vicinity are closed down or only working small shifts. Accomodations for travelers may be obtained here. Gasoline or oil not procurable.

B A L L A R A T

Ballarat is about 45 miles southeast of Darwin and the supply point for a number of mines in that locality. Automobile stage which operates daily between Trona and points south, carries mail, passengers and small freight.

DEATH VALLEY

Authority: C. R. Dudley, Pacific Coast Borax Company, Oakland

LOCATION AND TOPOGRAPHY

Death Valley is situated in the southeastern corner of Inyo County and presents one of the most striking examples of desert and granitic formation found anywhere in California. The scenery from the standpoint of the tourist is both weird and wonderful and its inaccessibility offers to the traveler who loves the hazard of dangerous travel, ample opportunity for the exercising of all his knowledge of the desert and if the trip is made via motor car, of his mechanical ability. The extreme heat which exists in this locality from about the first of June until well into September forbids any but those who thrive in intensely warm climates from journeying into Death Valley. In the spring of the year sand storms are constantly changing the topography of the floor of the Valley and making travel and the finding of roads a matter of conjecture. The floor of the Valley is at all times wastes of burning sand without sign of verdure and scarcity of water is one of the drawbacks in the establishment of mining properties in this district, as most of the water for camps must be teamed incredibly long distances and the few wells which do exist are brackish and unfit for human or animal consumption.

PRODUCTS

Borax and boric acid are the chief products of the Valley and here is produced about one-half of the supply of these minerals used in the U. S. annually.

TOWNS

Death Valley Junction is on the Tonopah & Tidewater R. R. and is the chief supply depot for the mines in the vicinity and further up the valley to the north. Here is situated gasoline and oil station, 2 general merchandise stores, school and boarding and lodging house conducted by the Pacific Coast Borax Company for the accommodation of its large crew and for the occasional traveler through the section. The population is about 75 permanent residents beside the fluctuating population of laborers employed in the mines.

DEATH VALLEY JUNCTION

Furnace Creek Ranch is about 60 miles north of Death Valley Junction and here is the only agricultural activity in the valley. A small plat on which various fruits and vegetables have been grown experimentally furnishes some interesting data which shows that with irrigation melons and truck may be grown here throughout the entire year. There are about 15 residents beside workmen from the mines which are situated a few miles distant.

ROADS AND TRANSPORTATION

The Tonopah & Tidewater R. R. connects Death Valley with Nevada and California points and the Death Valley R. R. runs from that town to the quarries and mines of the Pacific Coast Borax Company near Furnace Creek Ranch, in the canyon of that name. Wagon roads for use in the immediate vicinity of Death Valley Junction and Furnace Creek Canyon accomodate the resident and a county road winds over the shifting desert to Rhyolite, Nevada to the northeast and to Darwin to the northwest. Trips to either of these localities however, are ever fraught with danger to the traveler as neither oil, gasoline or water are procurable for many miles and the use of an automobile to make the trip is hazardous unless under the supervision of someone thoroughly familiar with the desert and all the trails and byways of its shifting floor. More lives have been lost in Death Valley and the Panamint than in other similar sections of the State and old residents who know the almost immediate prostration resulting when one is stranded in the valley, always advise travel by train into this section. An excellent road leads south 120 miles to Ludlow and points south.

Authority: L. L. Nunn, Deep Spring Ranch
W. V. Ellms, Supt., Deep Spring Ranch
Vivian Jones, Assessor Inyo County,
Independence.

LOCATION AND TOPOGRAPHY

Situated near the northeastern corner of Inyo County. Deep Spring Valley represents an agricultural area of about 12,000 acres lying on the valley floor, which is about seven miles long and two miles wide at its greatest width. At the present time 160 acres only is under cultivation with active preparations for an additional 160 acres now in progress. The land was originally taken up under the Desert Law Act and there is only one ranch in the valley being farmed. Situated beyond the summit of the Westgard Pass at an altitude of over 7,000 ft., far from adequate transportation facilities and experiencing hard winters of heavy snowfall, it is doubtful whether this area except as a huge unit of some agricultural reclamation enterprise, with plenty of financial backing, would prove profitable.

SOILS AND WATER

The soils range from coarse gravel through sand and sandy loam to clay and heavy adobe near the lake which fills the southern end of the Valley and raises the water table and alkali on much of the land in its vicinity. What irrigation is practiced comes from a creek fed by a spring from which the Valley takes its name, in the northwestern end of the Valley, and flows across the upper end and through the Deep Spring Ranch on the east side. Owing to great loss in seepage as it crosses the desert, from the point where it emerges out of the mountains, 160 acres have been about the maximum acreage which could be irrigated and domestic supply obtained from this source. The spring which feeds a small stream about half a mile below this ranch, on the east side of the valley, is a natural site for an impounding dam. It is contemplated by the present owners of the Deep Spring Ranch and neighboring property, that such a dam will be constructed during 1917 and the water pumped north for irrigation use. This will give a head of about 70 ft. and it is thought that enough water to answer seasonal requirements of alfalfa, fruit and field crops on about 600 acres.

TOWNS

The Deep Spring Ranch is the only ranch in the Valley and the Tulleride Association has commenced construction upon a two-story concrete hotel, and a power plant from which heat and light are to be generated for the convenience of the ranch. This Association has as one of its objects the training of young men along scientific and technical lines for scholarships in Stanford and Cornell Universities and this ranch is to be used more as an experimental and training schools for these students than for a money making institution, although it is the intention of the management to accommodate the increasing volume of travelers over the Westgard Pass to Nevada points and oil and gasoline station will be installed.

Registered Percheron and Belgian stallions are being shipped in and will be used to breed up the draft mares now on the ranch. Increased acreages of alfalfa will be planted and the quality of the beef cattle brought up by the advent of purebred bulls.

PRODUCTS

Alfalfa, sheep, wool, beef cattle, horses, some fruit and berries and enough poultry to provide the ranch table with meat and eggs are raised. Alfalfa cuts about four tons per acre per season here and there are under cultivation at the present time about enough to supply the ranch stock. The cattle and sheep are driven to Zurich for shipment or over the range to the north into the Nevada grazing lands and often reach markets in the mining camps of those districts.

ROADS AND TRANSPORTATION

Twenty-seven miles from Big Pine over the Toll Road of the Midland Trail and 65 miles from Goldfield, Nevada, the next stop where travelers may secure accommodations or meals, Deep Spring Ranch lies truly within a world of its own.

FISH LAKE VALLEY

Authorities: H. O. Wangelin, Supt. S.S.P.Co.,
Bishop
Vivian Jones, Assessor Inyo Co.,
Independence
A.P. Mairs, Treasurer, " "
Independence

LOCATION AND TOPOGRAPHY

Divided by the Mono-Inyo County and the Nevada State line, the greater part of Fish Lake Valley lies in Nevada with but the southern end extending into Inyo County. This is the lowest end of the Valley and a range of mountains separates it from Death Valley to the south. The greater part of the 900 acres lying in Inyo County is devoted to stock range although most of the entire area was homesteaded under the Desert Law Act and the majority of these abandoned for lack of adequate water. Dry farming has proved impossible. Some wells have been sunk but these neither flowed constantly and the cost of transportation on pumps and machinery was too expensive to warrant the outlay, or the water was brackish and unfit for human use or for stock.

SOILS

In the southern end of the Valley where undeniably an inland lake once lay, the soils run pure silt and toward the surrounding hills they are sandy and gravelly in character.

TOWNS AND ROADS

The few irrigated acres in the valley known as Oasis, lies in Mono County. Here are postoffice and grocery and if the traveler turns off the main road, he may be accommodated with meals and lodging. The Midland Trail crosses the southern end of the Valley which is about 14 miles west to Deep Spring Valley and 44 to Goldfield over excellent road, except on the valley floors where the fine texture of the soil makes soft roadbed with high center.

PRODUCTS

None, except as beef cattle are ranged here during the spring and summer months and sheep in the fall. Most of these belong to Inyo

Co. stockmen.

Authority: Mrs. E. H. Edwards, Lone Pine

LOCATION AND TRIBUTARY COUNTRY

Lone Pine is located in the southern end of Owens Valley, a few miles north of Owens Lake and is the division point for overland travel for the Keeler, Darwin and mining districts to the east. 16 miles south of Independence and 16 miles north of Keeler, Lone Pine boasts a population of about 650 within a three mile radius. The town sets on a slight elevation near the Owens River, while an outcropping of the Alabama Hills form its western wall, with Mt. Whitney and the snow clad Sierras beyond to the west. The chief agricultural activities are south of the town along either side of the State Highway, and here the City of Los Angeles maintains an extensive ranch where hay and grain as well as the meat supply for its mess houses and section camps throughout the Valley, is raised. The Beveridge Mine to the east across the river is tributary to Lone Pine and active machinery installation is now in progress.

SOILS AND WATER

The soils of the section run from gravelly and sandy loam to heavy clay, and in the lower stretches the water table is so high that intensive farming is impossible and the meadow lands are therefore devoted to pasture and grazing.

The domestic and irrigation water supply comes from Tuttle and Lone Pine Creeks and is piped across the City of Los Angeles Aqueduct which lies to the west. Irrigation is by small mutually owned concerns.

CHURCHES, SCHOOLS AND COMMERCIAL LIFE

Lone Pine has without doubt the finest church in the Valley, the Trinity Memorial Episcopal Church. This edifice is built of Oregon fir and its beauty of architecture and furnishings and fixtures, would be the pride of a much larger community than Lone Pine. Four memorial stained glass windows and altar also chancel furnishings are the donation of members of the congregation, most of them in memoriam of some departed member of the family. A Meth-

odist church is also important and a visiting Catholic priest officiates bi-monthly.

Grammar and the first year of High School answer the educational requirements and the Ladies' Aid Society, Civic Club, a social club for women, Red Cross Chapter, a Gun Club for the men with active membership of about 50, keep the social spirit alive. Here also are the headquarters of the Inyo County Livestock Association, which numbers every prominent cattleman in the County on its roster.

Lone Pine has 3 general merchandise stores, 1 drug store, stationery and novelty shop, 2 garages, one of which carries the largest supply of motor accessories and parts in the Valley and has vulcanizing plant in conjunction, gasoline and oil stations, new hotel, 4 restaurants, 3 pool halls, several rooming houses, physician and two dentists. Also moving picture theatre and social assembly and lodge hall.

PRODUCTS

Enough fruit and truck is raised to supply local demand and some for the tributary mining districts. The principal products are cattle, horses, sheep, wool, hay, sugar beets, wheat, barley, honey and hogs.

ROADS AND TRANSPORTATION

Lone Pine Station (formerly Mount Whitney) is $1\frac{1}{2}$ miles east of town on the broad gauge railroad which terminates at Owenyo, a few miles to the north. Daily trains for Mojave and Los Angeles to the south or Nevada points to the north, and three trains per week to Keeler, which return the following day. Motor stage daily to Darwin and tri-weekly to Bishop.

Lone Pine is on the State Highway and the roads in this section are especially good, as far south as Keeler and Olancho.

OWENS VALLEY

Authority: A.H. Swallow, Bishop

EXTENT AND LOCATION

Owens Valley is the chief agricultural area of Inyo County with approximately 116,150 tillable acres. It is situated in the western upper half of the County and extends for about 100 miles from north to south and drained throughout its length by the Owens River which enters the valley at the northwestern edge, flows almost directly east for several miles through a deep and picturesque canyon, to turn south and pursue its course toward Owens Lake. This valley at its northern end in the vicinity of Bishop is about 16 miles wide, narrowing just north of Big Pine to its least span of about 2 miles, where an outcropping of the Alabama Hills nearly makes a natural pass across the valley toward the White Mts. which border Owens Valley on its entire eastern side. South of here it again broadens to an average width of from 6 to 8 miles with the dead sea of Owens Lake forming the entire southern end. The Sierran wall the valley from the San Joaquin Valley on the west.

From the canyons on the west the alluvial washes of decomposed granite sweep fanwise to form the fertile mesas which extend from the base of the mountains toward the valley floor. The majority of these are watered by turbulent mountain streams which riot across the stretches of cactus and sage studded mesa to be utilized for irrigation and domestic supply by the farming communities which are almost without exception situated along the west side of the valley. The chief farming activities of the east side are around Laws and for a few miles south of that station. The topography, irrigation and general soil characteristics of the farming communities situated in the Owens Valley are given in the following pages, alphabetically, under the caption of "Towns".

The Owens Valley offers fertile empire for the progressive farmer. It possesses an abundance of rich and productive soil and water. It has long been held back by transportation

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costs both for freight and passenger service and by local conditions. These two causes for the Valley not before being opened up for the homeseeker and settler, are automatically adjusting themselves satisfactorily and Owens Valley is just beginning to come into its own.

GOVERNMENT LAND

Little or no government land which carries water right is obtainable. Many relinquished homesteads may be acquired, some of which have water right. Full and careful investigation should be made before closing negotiations for any property in this section, to ascertain that water right, as well as title to the land is full and clear. Dry farming is impossible here. This has been demonstrated on some of the desert homesteads in Fish Lake, Rose Springs and Deep Spring Valleys.

The average elevation is about 4,178 ft. with an annual precipitation of about 5 inches per year. Under "Climate" will be found climatological charts giving temperature and rainfall throughout the entire County.

CLIMATE AND HEALTH

The air is dry and healthful, especially beneficial for throat and lung troubles and it has been said that no "one ever dies here - just dries up and blows away!" Variations are great both in summer and winter and the warmest summer day is followed by a cool, delightful night. The humidity is greater in the northern end of the valley where irrigation ditches and the presence of pools and sloughs exhaust the clarity of the atmosphere. Heat prostrations are seldom known although the stranger to high altitudes should not over-exert until thoroughly acclimated, especially during the heat of the day.

A more healthful locality than Inyo Co. would be difficult to find.

TRANSPORTATION AND ROADS

The Mina-Keeler branch of the Southern Pacific enters the valley at the northern end and

connects at Owenyo with the Mojave broad gauge line of the same company. This line from the north extends through Owenyo along the eastern side of Owens Lake with terminal Keeler, from which vast quantities of the County's mineral wealth is shipped. It is very confusing to the average traveler that the stations of the various towns throughout the Owens Valley are in large measure not of the same name as the locality they serve. Effort to locate Bishop for instance in any of the railroad guides or time tables, results in failure because the station is known as Laws. The survey for the railroad was made before many of the towns were established and inasmuch as the land in the vicinity of the railroad line is unfit for agriculture, the higher and better drained portions on the west side of the valley were chosen for this purpose for the mountain streams come from the Sierras on the west while the water resources of the east side are meager. Following is list of towns in the valley and their corresponding railroad stations:-

<u>Town</u>	<u>Railroad Station</u>
BISHOP	LAWS
BIG PINE	ZURICH
INDEPENDENCE	CITRUS OR KEASARGE
KEELER	KEELER
LONE PINE	LONE PINE OR MT. WHITNEY
MANZANAR	MANZANAR

Daily trains carrying mail and passengers pass through the valley each way. Pullman sleeper connects with southbound train for Los Angeles and Mojave for points in San Joaquin Valley and north, at Owenyo. During the summer vacation and fishing season this service is maintained three times per week while during the winter months twice weekly.

The Tonopah-Tidewater R. R. goes thro Death Valley, south from Nevada and transcontinental mainline points to Ludlow.

The El Camino Sierra traverses the entire length of Inyo County through the Rose

Spring, Olancha, Owens and Round Valleys on its way to Mono County and the Yosemite Valley through the Tioga Pass, with continuation through to Lake Tahoe. This is one of the most popular highways in California and the larger part of the travel from southern California to the Sierra fishing, hunting and vacation points motors over this route. This is also the State Highway and legislation is now afoot to make it a national highway of permanent structure in event of universal preparedness.

Just north of Big Pine the Midland Trail digresses from the El Camino Sierra to become the only overland route which it is possible to travel during the entire year. Over the Westgard Pass at an altitude of over 7,100 ft., and through the wonders of onyx-tinted Box Canyon is a journey that the lover of scenic delights should not fail to take.

County roads bisect the passible mountain passes and endeavor is made to keep them in good condition. Throughout the valleys the roads in nearly all instances are good.

Inyo County is especially proud of its trails which lead to dizzying mountain heights and silent gorges in the Sierras, where dozens of sapphire lakes come unexpectedly into view, nestled on the mountain tops or along unlooked for ledges. The Sierra Club is foremost in exploiting and exploring these sometimes dangerous pathways of the high Sierras. The Club comes yearly to spend its vacation climbing various notable peaks, among them Mount Whitney best ascended from Lone Pine and Mount Williamson, reached from Independence, and only 14 ft. lower than the more famous mountain. From Independence a trail winds over the summit of the Sierras down into Kern River Canyon and thence to the San Joaquin Valley. Trips to the glaciers from Big Pine and Round Valley are perilously interesting to the lover of nature.

Motor stage plys between the railroad stations and towns, meeting all trains. Schedule of automobile stage lines running between Bishop and Lone Pine as well as Bishop and Round valley, tungsten mines, etc., is given under the heading of "BISHOP, ROADS AND TRANSPORTATION."

PANAMINT
VALLEY

Authority: A. A. Ross, Darwin

LOCATION AND TOPOGRAPHY

The Panamint Valley is topographically the northern end of Death Valley separated from it by low, shifting sand hills. It is about 28 miles in length with an average width of about six miles. Sloping toward the south with a drop of about 100 ft. per mile, it presents a spectacle of glittering sand when first sighted from the only road that enters it over the Darwin Wash. Like the Amargosa Desert and Fish Lake Valley, its soils are largely sand and gravels which without water are non-productive. The floor of the valley comprises about 20,400 acres and there is no settlement in the northern end of the Valley although the multi-colored mountains surrounding it on all sides, are probably rich with minerals and innumerable prospects have been made with greater or less degree of promise, by the "desert rats", these picturesque, migratory prospectors who with their string of burros, picks and frying pan, are the only class of miners who care to brave the scorching and treacherous reaches of the Panamint. The majority of the acres on the floor of the valley is open for homestead entry under the Desert Law Act but inasmuch as water is found only in isolated mountain canyons, in very limited quantity and often brackish and unfit for human consumption, it is doubtful if this area will ever be reclaimed.

In the Panamint Range on the east the Skidoo Mine was once well known for its gold production and its present inactivity is due largely to the heavy expense of trucking out the ore which did not warrant the loss of life and stock. The Wild Rose antimony mine has been pronounced by U.S. Geological survey men to be the largest known deposit of antimony. Between the southern end of Panamint Valley and Searles Marsh is a slate range while the lower end of the valley is marsh similar in constituents to the Searles Marsh. This contains soda, salt, borax and potash. These have never been worked owing to the intense heat of the Valley, cost of construction of railroad or adequate wagon road over which to handle the product. The Modoc and Minietta Mines in the Argus Mts. on

the west have famous histories dating back to the days of the first pioneers. All ore from these mines is handled through Trona, in San Bernardino County, but no active development work has been going on for some years. Copper and gold deposits are also found in the Argus Mts., bordering Panamint Valley.

TOWNS AND ROADS

Ballarat and Skidoo are the only settlements in the Valley. Lodging house, restaurant and gasoline and oil station may be found at the former and the Deasy Ranch at Skidoo provides accomodations for the traveler. Neither are within telephone or telegraph communication with the rest of the County.

Only one road and that easily lost, especially on the floor of the Valley which is shifting sand, runs south from Darwin. This passes through Ballarat going south toward Trona and a fork turns toward the east at the southern end of the first dry lake, which leads through Wild Rose Canyon to Death Valley Junction and Rhyolite, Nevada, further to the east. Skidoo is situated off this road about two miles and sharp lookout must be maintained by the stranger, in order not to pass the signposts. Water is not obtainable in sufficient quantities for a motor car after leaving the west side of the Panamint Valley and traveling should be done by night whenever possible, especially during the summer months. This Valley is famed for the beauty and number of the mirages nearly always visible during the afternoons, especially.

ROSE SPRING VALLEY.

Authority: H. O. Wangelin, Manager Bishop Light
& Power Co., Bishop
J. H. Lubkin, Lone Pine

LOCATION AND TOPOGRAPHY

Rose Springs Valley is situated south of Owens Lake and includes about 21,000 agricultural acres, about 100 of which are irrigated from springs in the hills. There are but few ranches in the valley. Borings for water have disclosed the fact that it lies very deep and wells or pumps would be prohibitive in cost of installation. The valley is about 18 miles in length with a width of probably six miles at the widest point and slope of nearly 150 ft. to the mile toward the east and south. The floor of the valley is rolling and irregular. The City of Los Angeles constructed its reservoir in Rose Springs Valley near the town of Haiwee. The rise of the reservoir waters has completely submerged this little settlement and the inhabitants were forced to move back some hundred of yards onto higher ground. Haiwee is now the station for the reservoir crew and gate men for the Los Angeles Aqueduct and is on the railroad.

There are barely half a dozen ranches in the valley and these not self supporting. The land in the valley was originally open for entry under the Desert Law Act but have been filed upon.

SOILS AND TYPES

The soils like others in this county are sandy and gravelly loam, coarse gravel toward the mountains on either side of the valley. In low spots dry salt lakes are found, as the result of evaporation of risen ground waters. In the hills to the east deposits of volcanic "glass" are plentiful.

ROADS - TRANSPORTATION - TOWNS

The State Highway or El Camino Sierra runs the entire length of the valley from south to north. One daily train each way stops at the railroad stations of Haiwee and Little Lake. The wagon road to Coso Hot Springs diverges to the east just below Cowan's Station which is situated on the Highway. At this station and

Inyo Co.

DISTRICTS

ROSE SPRING VALLEY

2

Little Lake travelers may secure accomodations,
gasoline and oil.

ROUND VALLEY

E. R. Jones, Round Valley,
Authorities: J. E. Roberts, " "

LOCATION AND TOPOGRAPHY

Round Valley lies about 12 miles northwest of Bishop. It is nearly six miles long with an extreme width of about two miles. From the upper mesa extending along the base of the Sierras on the west, the valley slopes toward the east with a drop of about 100 ft. to the mile. There are about 25 ranches in the valley, many of them established forty or fifty years ago. The elevation here is about 5,000 ft.

SOILS AND WATER

From coarse gravel, sandy gravel, sand and sandy loam along the mountain base on the west the soils run to clay loam and black adobe on the floor of the valley. The lower portion is under water during the high water period, generally June, July and part of August and little or no cultivation exists in this particular section. Grazing and meadow lands cover the center and northwestern portion.

Mutually owned irrigation system is controlled by the farmers of the district. Water for irrigation and domestic use comes from Pine and Rock Creeks. Here as elsewhere in the agricultural districts of Inyo County the water right goes with the land. Much of the valley drains into the Owens River canyon which touches the northwestern end of the valley, then turns toward the east.

PRODUCTS AND INDUSTRIES

Alfalfa hay, wheat, some barley and oats, corn, clover, timothy, some berries, Bayo, small white and Tepary beans, apples, pears, peaches, a few apricots, wool, sheep, beef cattle, horses and dairy produce. Most of this is used locally with the exception of beef cattle, wool, sheep and wheat with dairy produce fast coming into commercial importance. The season of 1917 saw the largest bean unit acreage in the County planted in Round Valley. Large yield per acre was realized from the experimental tracts planted the year previous.

A grist mill operates about eight months

ROUND VALLEY - 2

of the year and employs one man. The yields of the neighboring wheat acreage is sacked and shipped, refined. Capacity of plant about 2,400 lbs. per 24 hours.

One large dairy with purebred Jersey herd makes butter and ships cream to Bishop. Herds are being brot up and great interest evidenced by dairymen in this section to increasing the dairy production. One of the ranches in the north of the valley has the first silo erected in Inyo County, some forty years ago, of native stone and cement, with a capacity of about 100 tons. It is still in excellent and servicable condition. Sheep and cattle men usually spend 2 or 3 weeks in Round Valley on the way to and from Long Valley, the summer pasture lands, to the north in Mono County. Much tungsten ore is shipped from the nearby
TOWNS, ROADS AND TRANSPORTATION mines.

Postoffice, general merchandise store and school are located here. The locality is tributary to Bishop for trading and supplies while the neighboring tungsten mines are providing liberal market for much of the produce raised. Travelers may be accomodated at the Jordan or Roberts Ranches. Stock from the valley is driven to Laws for shipment.

Survey of the State Highway traverses the eastern side of Round Valley on its way toward resorts in Mono County and the Tioga Pass. Poor wagon roads radiate over the farming districts and to the tungsten mines while stage to Bishop makes three round trips per week, carrying mail, passengers and small freight.

Hunting and fishing in the mountain canyons on the west is unsurpassed.

SALT WELLS
VALLEY

Authority: H. O. Wangelin, Mgr. Bishop Light & Power Co., Bishop

LOCATION AND TOPOGRAPHY

The greater portion of the Salt Wells Valley lies in San Bernardino County but the northern end extends into Inyo County and contains several hundred acres of agricultural land not at this time under cultivation, owing to lack of adequate irrigation. The water supply is from wells bored mostly for domestic use and from small mountain streams on the west. The topography of the valley is gently rolling with a drop of about 150 ft. to the mile toward the south in that portion of the valley lying in Inyo County.

SOILS

The soils is pure silt in the lower part of the valley and shades into sandy and gravelly loam toward the surrounding hills with pure gravel and granite found close to the mountains. Under irrigation the soils are very productive. They are largely of volcanic origin.

TOWNS, TRANSPORTATION AND PRODUCTS

Narka and Linnie are the railroad stations situated on the mainline branch of the Southern Pacific which runs north from Mojave. They enjoy a train each way over this line, daily. Each also has its general merchandise store where both gasoline and oil are procurable.

Some ore and soda is shipped and gardens about the two towns in the valley help fill some of the demands for vegetables and fruit, of the community.

Bands of beef cattle and sheep are sometimes winter pastured here.

B I G P I N E

L.L.Goen, Pres. Big Pine Improvement
Authorities: Club
George Hall, Big Pine Lumber Co., Big
Pine

LOCATION AND TRIBUTARY COUNTRY

Big Pine is backed by the Alabama Hills on the west which rise to a few hundred feet between the town and the Sierras, with a break in the chain just southwest of town. From the upper mesa lands formed by the alluvial washes from these hills, the land slopes toward the Owens River on the east with a drop of about 80 ft. to the mile, although along the Highway 1 mile north and 8 miles south of town the land could better be described as gently rolling and the chief agricultural production is in this area.

SOILS

The soils of the section shade from gravel and sand near the mountains on the west to loams and heavy clays in the lower portions which are badly in need of drainage. A few miles south and east of Big Pine is the Tinemana Reservoir which is in reality an overflow and backwater of that portion of the valley. Morine granitic formation is found along the slopes of the mesa unmistakably of volcanic origin and on the floor of the valley volcanic ash soils rich in humus, make the crops grown there of high yield.

SCHOOLS, CHURCHES AND COMMERCIAL LIFE

Big Pine has Union High and grammar schools and the U. S. Indian Service maintains a school for the instruction of about 20 pupils and it is contemplated that reservation of lands near Big Pine will be made by the Service in the near future. These are about the last of the Paiutes who once held almost the entire northern end of Owens Valley and they prove with education good farmers, hired help and students.

Big Pine wears an air of bustling activity at all times and for its size is perhaps the most progressive commercially in the valley. Here are located Methodist church, hotel, several lodging houses, meat market, 2 general merchandise stores, provision store. 2 hardware stores. 2 con-

ages, drug store, 2 pool rooms, 2 gents' furnishing stores, moving picture theatre and social hall 2 lumber yards, 2 restaurants, 2 candy stores, blacksmith shop and stone and granite supply yard.

The Big Pine Improvement Club is a strong commercial organization with the betterment of local conditions and civic improvement with good business practices at heart. It has stood behind such endeavors as the completion of the Midland Trail which starts at Big Pine, drainage system for the northern end of the Valley, reduction of transportation rates, etc. It numbers farmers as well as merchants of the section on its roster.

Weekly newspaper is published. Literary society, dramatic club, branch County Library and excellent swimming pool situated about $1\frac{1}{2}$ miles north of Big Pine afford diversion to suit the taste of the resident.

COUNTY POOR FARM AND HOSPITAL

About 2 miles north of Big Pine the County Poor Farm and Hospital occupies about 80 acres, 50 of which are under intensive cultivation not only raising enough truck and fruit to supply the table at the institution but to further help meet the demands of the neighboring town. Here are comfortable and well kept buildings with accommodations for about 15 inmates, some of whom assist at light tasks in the gardens and around the institution. The main dormitory was burned early in 1917, and plans for a fireproof building are now before the State Board of Charities and Corrections, for approval.

WATER, ROADS AND TRANSPORTATION

Both the domestic and irrigation supply comes from Big Pine, Little Pine and Baker Creeks. The irrigation canal system is mutually owned and operated although an irrigation enterprise is contemplated for further developing the tributary lands, under which the land will be sold with water right to certain acre feet and title to same free and clear.

Zurich is the railroad station on the east side of the valley and several farms which derive their irrigation supply by pump from Owens

River are situated here. It is 2 miles east of Big Pine and on the Midland Trail, which is the only transcontinental route for motors to the East from Central California and open the greater part of the year.

One train each ^{way} daily and motor stages connect Big Pine with Nevada and mainline points north and the southern part of the State. Excellent roads distinguish this section.

The Montezuma Mines lie to the east in the White Mts. and about 2 carloads of silver-lead ore and tungsten are shipped from this section, daily. All supplies for these camps as well as Deep Spring and Fish Lake Valleys are taken from Big Pine.

An excellent concrete swimming pool has lately been installed on the State Highway a short distance north of town and is a delightful feature in summer weather.

The State Highway (El Camino Sierra) traverses the district from north to south.

B I S H O P

Authorities: J.W. Bernard, Secretary Chamber of Commerce, Bishop
Fred M. Hess, Manager Bishop Telephone Company, Bishop

LOCATION AND TRIBUTARY COUNTRY

Commercially, agriculturally and in progressive and cooperative spirit, Bishop is the heart of Inyo County. In the vicinity lie the largest agricultural acreages in the County and from this section come the largest shipments of commodities to outside markets. Bishop is situated at the northern end of the Owens Valley about two miles south of the point where the Owens River in its eastward course from the mountains, has cut a picturesque and deep channel across the desert toward the town of Laws. Toward the Sierras on the west the land slopes with a drop of about 80 ft. to the mile eastward, and in the immediate vicinity of the town of Bishop, the water table has risen and there is need for proper drainage. This condition exists throughout the entire district with the exception of the Sunland area which lies on the mesa to the southwest on much higher ground.

As viewed from the opposite side of Owens Valley, the western side presents a picture of warm, brown desert dotted and streaked by the vivid green of the agricultural areas and streambeds, as they issue from the mountain canyons. While the western side seems but gently rolling, by observation from the hills on the east, the impression remains, that the slope is so abrupt that the view is all prospective.

SOILS

From the mesa lands and alluvial fans which wash down from every mountain gorge, the soils run from gravel, through gravelly and sandy loams to heavy clays and ashy soils rich in humus, on the valley floor. These with proper drainage and tillage are productive to the highest degree.

SCHOOLS, CHURCHES, SOCIAL LIFE

Bishop has grammar and Union High School and private kindergarten. An Indian school is also located here under the direction and espondage of the

U. S. Indian Service, with about 70 pupils.

Episcopalian, Presbyterian, Baptist, Methodist and Christian Science churches meet the religious needs of the community.

Nearly all of the prominent fraternal organizations with womens' auxiliary parlors, are represented and a joint meeting place fully equipped to meet the demands of extensive social gatherings is now nearing completion.

Bishop has a most modernly equipped hospital with accomodation for about 20 patients and maintains competent staff of physicians and nurses.

The town has theatre and moving picture house in which tri-weekly reels are shown. Large social and assembly hall furnishes opportunity for dances and other gatherings.

The Bishop Chamber of Commerce is a live and progressive organization with one of the largest memberships per capita, of any similar organization in California. About 12% of the business and farming population of Bishop, being members. It has sponsored some important and imerative movements, not only for local but County advancement and welfare, such as the El Camino Sierra, toward which it raised many dollars and now maintains a representative in San Francisco, who is closely in touch with State and Federal officials and whose aim is the making of a permanent concrete highway for purposes of national defense in time of urgency. It exploited and made possible the opening of the Midland Trail, the only route through to the East from central California which is nominally passible the entire year. It employed for some months a press representative whose energetic campaign gave the newspaper reading public some idea of the extent and wealth of Inyo County and the beauty of its mountains and valleys as a natural playground for the motorist and tourist. The Bishop Chamber of Commerce fostered the reduction in railroad tariff that the merchant and farmer of Inyo County is saved over \$50,000 yearly and may bring in goods or move his crop to better advantage and profit. It is still working on this problem

B I S H O P - 3

and has another even larger and more important one in hand - that of the proposed irrigation and drainage system. Information and literature is furnished the inquirer either by letter or personal application to the Secretary. Correspondence is solicited.

The El Pinon Club is the most extensive of the social organizations. A social club with attractive and spacious quarters, it is located in one of the office blocks of the town and is noted for the novelty and elaborateness of its entertainments and Ladies' nights.

The Womans' Improvement Club, Red Cross, Literary and Dramatic Societies give much opportunity to the women of the community to advance the cause of civic and social improvement as well as pleasant relaxation from domestic and business duties.

INDUSTRIES AND BUSINESS ENTERPRISES

Bishop has one of the finest business blocks to be found in any town of its size throughout California. In addition several modernly equipped buildings are tenanted by professional and business men. Negotiations are under way for a Carnegie Library to be built in the near future. The streets while not paved are broad and well kept. The business and many of the sidewalks in the residence section are concrete. Electric and arc lights are found throughout the principal thoroughfares while telephone and telegraph service is enjoyed by the entire valley as well as the town of Bishop. By digression from the main thoroughfare, one comes upon attractive homes set in bowers of garden and shade trees.

All the professions are well and capably represented and a metallurgist and assayer is also found in Bishop, who helps solve the many hopes of the enthusiastic mining man coming from the hills laden with canvas sack of samples.

Splendid water system with high pressure for emergency, is maintained and septic sewerage system. A high power motor truck and chemical engine with volunteer fire department, renders efficient service when needed.

B I S H O P - 4

In addition to stores answering the needs of a community of 2,000, Bishop has as large industrial enterprises 3 lumber yards, flour mill, (which runs constantly and employs 4 men) 3 hotels, several lodging houses, 3 garages, 2 vulcanizing plants, 4 oil and gasoline stations, 2 large farm implement and hardware stores (one of which does as large business as any store in California in proportion to the size of the town), 2 drug stores, 3 livery stables, stationery and office supply depot, 2 millinery stores, etc.,

A most important industry is about to begin in the making of fire clay pipe. Material for this is obtainable in the White Mountains to the east and while the product will be manufactured there, the selling station will be in Bishop. This type of tile pipe is greatly in demand here for irrigation and drainage canals and such supply at price without the high freight rate which now brings the cost up materially, will help to meet the large local demand and need.

ROADS AND TRANSPORTATION

Bishop is the supply point for many of the tungsten mines lying northwest of town and also the starting point for many of the fishing and vacation camps in the Sierras. It lies 16 miles north from Big Pine and 45 miles from Independence, the County seat to the south on the State Highway or El Camino Sierra. From Bishop roads radiate to all parts of the county as well as north toward the Yosemite Valley thro the Tioga Pass, and to Lake Tahoe.

Laws, the railroad station for Bishop is five miles distant to the east and motor stage brings passengers and small baggage, while trucks do the heavy hauling. One train each way daily, over the Mina-Keeler branch of the Southern Pacific, affords transportation either to the north and east or Los Angeles and S. F. by way of Mojave. Sleeper makes two weekly trips into Owens Valley on the broad guage as far as Owenyo, and returns to Los Angeles the following day. Automobile stages run tri-weekly trips from Bishop to Lone Pine at the southern end of the Valley, returning alternate days; 2 daily stages to the tungsten mines and Round Valley.

The matter is now under advisement to establish a breeding and training farm for Government horses intended for the Cavalry and Artillery, in the Owens Valley. Certainly no more healthful place for the raising of fine horses could be secured and the horses of this section have always been noted for their strength and endurance.

The value of town improvements is \$309,790.; assessed valuation \$1,153,297.; bonds outstanding at end of 1916, \$65,700.; total highest tax rate \$1.30.

Bishop is an incorporated town of the 6th class.

I N D E P E N D E N C E

George Shuey, Independence
Authorities: George W. Naylor, Supervisor, Inyo Co.
Independence
J. L. Polk, Druggist, Independence

LOCATION AND TOPOGRAPHY OF TRIBUTARY COUNTRY

Independence is the County seat of Inyo County and here is situated the Court House and County Jail in the center of an attractive home community where the beauty of the flower gardens and the picturesque architecture of the homes, immediately impresses the visitor most pleasantly. Within a radius of 8 miles its population is about 750. The water supply is from Pine and Pinyon Creeks used both for irrigation and domestic purposes. The Independence District may said to extend from about 3 miles south to 12 miles north of the town and from the boundaries of the Inyo National Forest Reserve on the west which runs along the base of the mountains, the land slopes toward the east and south with a drop of about 150 ft. to the mile toward Owens River on the east and 40 ft. to the mile from the outskirts of town toward Manzanar on the south. From a mile east of town to the river the country is chiefly level grazing land, covered with salt grass. From two miles north of Independence the country is intensely cultivated in a strip about a mile wide, which extends east and west from the Highway some two miles along the banks of Oak Creek. Here were located a fort and stockade in the days of Indian siege and many small tracts are farmed by the Indians on Government grants while the larger acreages are utilized for diversified crops. These may properly be said to be the chief agricultural districts of Independence and the section is known as Fort Independence although no post-office is located there and all trading is done with the County seat.

SOIL AND TYPES

The decomposed granite of the alluvial washes which sweep fanlike from large gorge and canyon of the Sierras, render the soils west of town and on the slopes until the floor of the Valley is reached, gravelly and sandy in character; very productive when irrigated although prone to soil washing and difficult to handle under irrigation, without concrete ditches or other means of

preventing excessive seepage. Toward the Valley the soils of this section shade more into the loams and clay loams with many acres of heavy "adobe" beneath the grazing lands on the floor of the Valley. Here the ground waters often completely flood the land, bringing to the surface large quantities of alkali and preventing cultivation. It has been suggested that the most economical means of draining this land and fitting it for the intensive agriculture for which it is eminently suited, being rich in humus, would be the boring of a string of artesian wells and the water conveyed into proper and sufficiently large channel to reclaim this portion of the Valley. See subject of "IRRIGATION AND DRAINAGE".

The soils may be said to run fairly uniform throughout the areas under cultivation and while there are idle many acres to north and south of Independence which undoubtedly would yield satisfying crops, the water rights would not be obtainable and dry farming has proved to be a rank failure in this country where the rainfall seldom exceeds 4 inches per annum.

SCHOOLS, CHURCHES AND COMMERCIAL LIFE

Independence has a Union High School and it is contemplated that the fall term of 1917, will see a Commercial Course added to its other branches. Grammar school accomodates the elementary pupils of the town. A Methodist church and visiting Catholic priest supply the religious wants of the vicinity.

While Independence is not an incorporated town its streets and stores seem always busy and it is considered by many travelers to be the most picturesquely situated of any in the Owens Valley. The Court House represents an investment of \$22,000. and in the day of its building was the acme of architectural skill. A new Court House to cost \$100,000. is contemplated for the near future. The County Jail is reinforced concrete constructed at a cost of \$15,000.

The domestic water supply of the town is governed by the Independence Water Company and high pressure maintained in case of fire.

Independence has two hotels, garage, vulcanizing plant, oil and gas stations, restaurant, 2 pool halls, 2 general merchandise stores, drug store, barber shop, 2 meat markets, telephone and electric light service, physician, dentist, large social hall in which dances, picture shows and other social gatherings are held.

The Independence Commercial Club, Ladies' Aid Society, Red Cross and Womens' Literary Club do much to promote civic improvement and literary, as well as social activity. The Masonic Lodge and IOOF are represented. The U. S. Land Office is also located in Independence.

The town is notable for the fact that it is from here one must leave to go through the high Sierras over the Keasarge Pass, into the Kings River Canyon. Mt. Williamson only 14 ft lower than Mr. Whitney stands sentinel to the southwest and challenges the mountain climber. The Fish Hatchery which will be the largest and best equipped in the State when completed, is only 4 miles from Independence and the station of the District Forest Ranger but a couple of miles further up the same canyon.

Weekly newspaper is also issued.

PRODUCTS

Nearly all the products of Independence and surrounding country are consumed locally with the exception of pears, honey, peaches, apples, beef cattle and some poultry and eggs shipped to the mines on the east side of the County. Sugar beets, contracted for by a factory near Los Angeles, alfalfa, corn, barley, berries, sheep, wool and horses. Los Angeles is the principal market for produce shipped in carload lots and it is only a matter of adequate transportation and possible reduction in freight rates which keeps back larger shipments and denies the farmer the incentive to raise more produce. Meadow and grazing lands feed large herds of cattle and sheep during the winter months in the vicinity of Independence.

ROADS AND TRANSPORTATION

Keasarge is the station for Independence

- formerly known as Citrus - on the Mina-Keeler branch of the Southern Pacific and is about 5 miles to the east. Trains to Nevada and northern mainline points and south to Los Angeles leave one each way, daily. Automobile busses from the hotels meet all trains. Motor stage from Bishop to Lone Pine operates thro Independence three times a week, returning north the following day. The surveyed and graded State Highway or Camino Sierra as it is called, runs thro the town and excellent roads radiate to ranching districts of the section.

The home of Mary Austin on the edge of Nabot's Field, which she has made famous in her interesting description of Owens Valley, its life and traditions, "The Land of Little Rain" is situated on the west outskirts of town and is a source of much interest to tourists.

K E E L E R

Authority: Vivian Jones, Assessor Inyo County,
Independence

LOCATION AND TRIBUTARY COUNTRY

Keeler may well be said to be the richest industrial town in Inyo County and seen from the west side of Owens Lake it presents a picture of manufacturing activity. Situated on the east shore of Owens Lake and the terminal of the Mina-Keeler branch of the Southern Pacific, its steadily increasing manufacture of salt, soda and talc as well as the immense shipments of silver-lead ore and concentrates, zinc, copper, gold, etc., which come from the tributary mining districts in the White and Argus Mountains to the east, make it the largest shipping point on the railroad. The water supply comes from springs in the mountains to the east and is piped into town. No agriculture possible on account of its proximity to the lake.

PRODUCTS

Refined soda, salt, talc; ore and concentrates from the silver-lead, zinc, talc, copper and gold mines in the neighboring districts. Here also are the terminals of the Saline Valley and Cerro Gordo tramways.

SCHOOLS, CHURCHES AND COMMERCIAL LIFE

Grammar school, one church, 3 general merchandise stores, garage, gas and oil station, 3 restaurants, 2 hotels, several rooming and boarding houses to accommodate the large crews of the neighboring plants, lumber yard, 2 pool halls and moving picture theatre and social hall. The salt, soda and talc plants all have their little settlements of workmens' cottages in immediate vicinity but many live in Keeler.

ROADS AND TRANSPORTATION

One train each way daily leaves Keeler for Nevada and northern main line points and by changing at Owenyo, connection is made to Mojave and Los Angeles as well as San Joaquin Valley points. Daily motor stages ply to Darwin and Lone Pine. Wagon roads north are excellent and along the lake-shore to Olancha on the southwest, except in time

KEELER - 2

of high water or storms, when part of this road is under water. Much heavy hauling to Darwin and the mines en route keep the roads in that direction in badly cut up condition.

Keeler enjoys electric light, telephone and telegraph service.

L A W S

Authority: J. L. Gish, Laws

LOCATION AND TRIBUTARY COUNTRY

Laws is the railroad station and shipping point for Bishop, which lies 6 miles to the west. It is one of the original settlements in the valley and ruins of the old stockade and many of the stone and adobe houses where the first election in the county brought out a polling of over 300 votes, may still be seen a few hundred yards west of the present village. This settlement was known as Owensville. To the north and south of Laws are many highly fertile acres. One of the largest purebred hog ranches in the valley is located here and several large dairies. The products, chiefly hay, hogs, fruit, corn, wheat, oats, barley, some berries, honey and dairy products supply local and Bishop demand and some goes to the mining camps in Nevada and Los Angeles markets.

SCHOOLS, CHURCHES AND STORES

Church, grammar school, drug, 2 general merchandise and notion stores, oil and gasoline station, lumber yard and meat market.

Water for irrigation and domestic supply is pumped from Owens River.

ROADS AND TRANSPORTATION

One train each way daily passes through the town and motor stage meets each train and carries passengers and small baggage to Bishop.

Good roads lead north to Chalfant Valley just over the line in Mono County; east to the extensive gravel pits which supply road ballast for the locality; south to ranches and other railroad stations along the line of the Southern Pacific; on the east side of the valley and to Bishop on the west. This road to Bishop is the poorest in the County to heavy and extensive hauling constantly in progress.

MANZANAR

Authority: I. L. Hatfield, Manzanar

LOCATION AND TOPOGRAPHY OF TRIBUTARY COUNTRY

Manzanar is situated 6 miles south of Independence and 10 miles north of Lone Pine at the southern end of the Owens Valley. It may be said that Manzanar unreservedly shows the greatest agricultural progress of any of the farming sections in the Valley. With the taking over of about 3,000 acres by an improvement company who have subdivided into 10, 20 and 40 acre tracts, intensive farming has been extensively practiced and after the antique and slipshod cultural methods seen so often throughout other sections, Manzanar with its every acre working, concrete irrigation system and general appearance of tidy and up-to-date small ranches, is distinctly refreshing. The tributary country might be said to commence about 3 miles south of Independence and extends south from the town of Manzanar about 4 miles, with an average width under cultivation of about 1 mile. Toward Owens River on the east the land slopes about 75 ft. to the mile with an almost imperceptible southerly slope toward the Alabama Hills which form a natural fence between Manzanar and Lone Pine.

SOIL TYPES AND WATER

From the west to east the soils range from pure sand to heavy black loams and clay loams with plenty of alkali on the bottom lands two miles east of town, which are used chiefly for grazing and in this as in other localities, lying along the Owens River, are badly in need of drainage. Water for irrigation and domestic purposes comes from Shepard, Bair's and George's Creeks. Is under pressure system for serving the subdivision proposition which constitutes a large part of the Manzanar District and is conveyed to the highest corner of each tract by concrete and steel conduits. The water table under much of the gently rolling land which makes up the tract is from 3 to 15 ft. below the surface and to avoid drowning out the land here as in other districts where scant heed has been given, it is contemplated that work on a tile or concrete drainage system with extensive laterals throughout the entire district, will commence during the late summer or fall of 1917. The irrigation system

here installed is complete, effective and the approximate cost of upkeep small. It is the only one of its kind in the County and well might be investigated by other sections of the Valley which are constantly experiencing irrigation difficulties. The irrigation system is mutually owned. Each land owner acquiring one share of water stock with each acre of land purchased and is assessed with a pro rata of the upkeep of the system, services of a zanjero, etc., which amounts to about \$2.50 per year per acre ft.

SCHOOLS, COMMERCIAL IMPORTANCE, PRODUCTS

Grammar school instructs pupils until the high school grades are reached, when they must go to Independence for those grades. Methodist church society administers to the religious wants of the community.

The company which controls the tract has within the past six years made exceedingly large plantings of apples and pears and are taking care of many of these young orchards for absent owners. The chief products are alfalfa, wheat, honey, apples, pears, peaches, corn, poultry and eggs, onions, potatoes and truck which find ready local markets either at the mining camps of the Reward Mine a few miles to the east or around Keeler and in the town of Independence. Berries bear full crops but the market is limited until transportation rates are adjusted, in order to ship out of the district with a profit. A small cannery is operated about three months of the year.

The town is embryonic consisting of a general store where gas and oil may be obtained, postoffice and office of the subdivision company.

ROADS AND TRANSPORTATION

The town is 4 miles west from the railroad station of same name on the Mine-Keeler branch of the S. P. and trains operate one each way daily. Automobile stage from Bishop to Lone Pine is supposed to pass through Manzanar three times a week, returning north the following day, but the schedule is uncertain. Good roads are found throughout the entire district. Electric light and telephone service is supplied.

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MANZANAR - 3

The aqueduct for the City of Los Angeles runs parallel with the Owens River about $3/4$ of a mile from the town of Manzanar to the east, and much of the land on the floor of the valley extending to east and west of the aqueduct is held by the City, ostensibly for "agricultural purposes", but used principally for grazing land.

O L A N C H A

Authority: Vivian Jones Assessor Inyo County,
Court House, Independence

LOCATION AND IMPORTANCE

Situated at the southern end of Owens Lake, Olancho is 41 miles south of Independence and 25 miles south of Lone Pine. It is a community of little importance, being off the railroad and much of the surrounding country marsh and meadow land. It is remarkable that the precipitation here is much heavier than anywhere else in the Owens Valley, spring and summer showers, frequent.

PRODUCTS, ROADS AND TRANSPORTATION

Some Honey, hay, wheat, fruit, cattle, horses and truck are raised but the production hardly meets local demand the that of the new soda plant a few miles north on the lake shore.

The railroad station, Cartago, is about 3 miles distant on the S. P. broad gauge which extends to Owenyo and over which passes a train daily, each way.

The State Highway runs through the town.

Gasoline and oil station, general merchandise store, grocery, blacksmith shop, grammar school and social hall are found here. The population is about 40.

SCHOOLS &
LIBRARIES

SCHOOLS

Authority: Mrs. M.A. Clarke, County Superintendent
of Schools Inyo Co., Bishop
L. L. Goen, Superintendent U.S. Govern-
ment School, Big Pine

Inyo County since 1916 has created two Union High School Districts, Lone Pine and Independence, in addition to those of Big Pine and Bishop, the first in the County and for many years kept up by public subscription. The enrollment in 1916 for the two High School Districts was 180 pupils with 11 teachers employed and in 1917 in the four districts, 194 pupils were taught by 14 instructors. The Union High School at Bishop has pupils from every part of the County north of Big Pine and the largest attendance. In addition to the regular complete and most thoro course of instruction in the Bishop Union High School, classes in manual arts, domestic science and commercial courses are maintained. A commercial course is also being installed in the Lone Pine Union High School and possibly in the Independence Union High School with the beginning of the fall semester of 1917.

It is noteworthy that the graduates of the Union High Schools of Inyo County are accredited to the University of California and the University of Southern California, without entrance examinations.

Athletic sports for both sexes are encouraged and the Bishop football and track teams have returned victors and in a few instances good losers, from meets with the High Schools of Nevada.

The property valuation of schools throughout the County including buildings, lots, furniture and fixtures is \$101,235., and the bonded indebtedness \$66,250. more than half of which belongs to the town of Bishop on the Bishop Union High and Bishop Grammar Schools.

The enrollment in the elementary schools for 1916 was 872 and in 1917, 935 with 37 teachers employed. A stranger traveling through the country for the first time is impressed with the number and frequency of the school buildings, several of which are modern in every detail and most

pleasing in architecture. Four concrete school buildings are among the pride of the residents, one of these in Round Valley costing \$8,000. and the grammar school in Bishop represents an expenditure of \$24,000. No district is too remote to come under the personal attention and supervision of the Board of Education and the Death Valley and Tecopa Districts have their "temples of learning" as well as the more accessible sections of the County.

Darwin has a bonded indebtedness for a school house to be erected for the fall term of 1917. Perhaps nowhere in California has effort been made so perseveringly to train the minds of the children, as here. Men and women have generously sacrificed their time, money and private property to aid the start of a little school, which perhaps was not yet of sufficient size to warrant being created a school district and too far distant from the nearest one to permit the children to travel back and forth. Classes have been taught in one little room partitioned from the meagre living quarters of some remote rancher or mining man, and have from such beginnings grown to sure success and importance.

PRIVATE SCHOOLS

A day kindergarten is maintained in Bishop.

INDIAN SCHOOLS

Schools for the Indian children are maintained in Bishop, Big Pine and at Fort Independence. Here the young men and women are instructed not only in the academic branches but in agricultural and livestock methods as well, domestic science, dress making and other helpful courses for the practical maintainance of a ranch and home. It is indicative of the younger generation of these Indians that they make good agriculturists and many are excellent students, ranking many of the white pupils.

At Fort Independence the U. S. Indian Service has appropriated small tracts to many of the heads of families and these present a scene of neat and intensive farming. This is one of the most fertile districts in Owens Valley and some

bumper crops come off the Indian farms along Oak Creek. Many of the Indians hire out as farm hands during the harvest seasons providing the staple help of the Valley. The women take washing and some of the young girls are often employed on ranches and taught to become good cooks and general household maids.

Many of the Indians in the vicinity of Bishop have homesteaded land northwest of town and have prosperous and well kept farms. It is contemplated that Government appropriation will be made for those who have no place of residence or steady employment in this district, in the near future.

LIBRARIES

Authority: Blanche Chalfant, County Librarian, Independence

A Carnegie Library is expected to be awarded either to Bishop, Independence or Big Pine.

The Inyo County Free Library has rooms in the Court House, Independence where two librarians are employed and branches in ten other towns, including Big Pine, Bishop, Darwin, Independence, Keeler, Lone Pine and Manzanar. There are 6,596 books and 108 periodicals and magazines on file and ten librarians beside the County chief, employed for the community branches. These librarians also act as custodians for school district libraries which are found throughout many of the principal school districts. It is contemplated that additions of community branches will soon be made in other districts throughout the County.

Authority: Bertrand Rhine, Hotel Istalia, Bishop

Inyo County is rich in facilities and opportunity for fishing, hunting and interesting trails to bits of magnificent scenery, not only throughout the Sierras on the west, but if one cares for the painted grandeur of the desert, the White, Argus, Funeral and Panamint Mts. on the eastern side of the Owens Valley afford wonderful opportunity to the lover of the desert.

ANDREWS CAMP

Situated at an elevation of 8,110 ft. in a beautiful mountain meadow, flanked by the tops of the surrounding mountains, Andrews Camp is open from May 15th, to September 15th. It is reached by turning southwest off the State Highway about 3 miles west of Bishop and is on the headwaters of Bishop Creek. Cottages and tents accomodate the vacationist and some are equipped with housekeeping utensils. Stage meets guests by appointment at Bishop, 18 miles distant. It may also be reached by trail and road from Fresno on the San Joaquin Valley side. Frank K. Andrews, Bishop, is the manager and inquiries for rates, etc., should be addressed to him.

CASA DIABLO SPRINGS

These springs are properly in Mono County but are reached only thro Bishop in team or motor car, or over the Tioga Pass Road through the Yosemite Valley. Great medicinal properties are claimed for rheumatism and kidney complaints and many go there yearly from Mono and Inyo County towns to bathe.

COSO HOT SPRINGS

See "Darwin" under heading "Districts". For information address Frank Adams, Coso Hot Springs, Inyo County, Calif.

COTTONWOOD CREEK SPRINGS

Camp with tents and housekeeping accommodations in an ideal locality where good fishing abounds a few miles from Lone Pine, to which it is tributary for transportation and all supplies. For information address Mrs. E. H. Edwards, Lone Pine.

FISH HATCHERY

Authority: F. A. Shebley, Superintendent
Mount Whitney Fish Hatchery

The Mount Whitney Fish Hatchery is the largest and best equipped fish hatchery in California and is under the jurisdiction of the State Fish and Game Commission. It has a yearly capacity of 6,000 fry and Gold, Steelhead and Rainbow Trout are the product for 1917 during the few months of its operation after the completion of the building. The structure is picturesque and on the type of Swiss chalet, built entirely of native stone, roofed with tile. Active work on grading and broadening the road which leads to the State Highway and to Independence, a distance of 4 miles, is going on and an attractive terrace extends the entire east length of the building. This will be planted with shade trees and auto trucks for use in hauling the fry and sprinkling the roads, are already installed.

The interior of the building is natural finish Oregon ash and the fixtures and floor plan is distinctly refreshing and modern without being ornate. The hatching room is 100 x 70 ft. and the constant purling of the mountain water as it rushes over the sieves above the troughs, makes the atmosphere cool and delightful on the warmest day. Applications for fry may be made to this hatchery with the name of the nearest railroad station at which they may be delivered. The fry are liberated at about 4 months of age and the hatching process takes about 2½ weeks. The young fish are fed fresh liver, parboiled and ground very fine and sweet milk curd until time of shipment. It is an interesting sight and visitors may feel assured of courteous reception and a couple of hours very interesting demonstration and instruction while visiting the hatchery.

From 5 to 7 men are constantly employed in addition to the road and construction crew which will be busy for at least six months more. The hatchery was opened in the spring of 1917 and but a part used to supply the planting in local streams for this season.

Not only is stream fishing unexcelled in Inyo County, but the size and gameness of the big trout found thro'out the many mountain lakes nestling in the Sierras, make devotees of the gentlest art, seek their solitudes during the open season.

MAMMOTH SPRINGS

This is a mountain camp situated 45 mile north of Bishop and reached by team or automobile from there. It is properly situated in Mono County but is tributary to Bishop and the starting place for so many interesting and historic trails, that it is given mention in this publication. Here are tent houses and accommodations for housekeeping quarters are obtained, together with rates by addressing Len Summers, Bishop. Splendid hunting and fishing in the vicinity.



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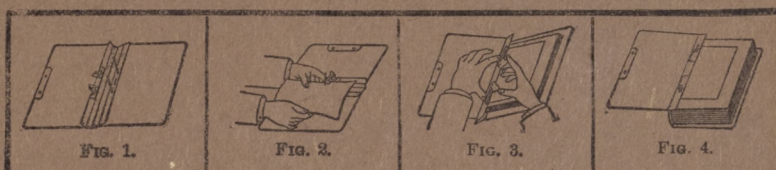
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